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# THE NATIONAL GEOGRAPHIC MAGAZINE

NOVEMBER, 1910

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## ANNOUNCEMENT.

THE forthcoming publication of a new edition of the *Encyclopædia Britannica*, being the 11th Edition since the first appearance of this celebrated work in 1768-1771, will be the most important literary event of the present generation. No completely new edition has appeared since the issue of the Ninth, of which the first volume was issued in 1875, and the twenty-fifth in 1889.

The new work, to be published by the University of Cambridge, will embody certain new features as regards its literary contents, editorial plan, and format which it is the purpose of this announcement in the United States and Canada, and of similar ones in all other English-speaking countries, to make public.

The passing of the copyrights into the keeping of an ancient institution devoted to learning will give the *Encyclopædia Britannica*, for the first time in its history, the character of a public enterprise rather than that of a private undertaking on the part of one publisher after another. It is a natural culmination of the modern tendency towards expansion under the impulse of which the name "University" has come to include all men and all studies. The necessary diffusion of knowledge outside the circle of mere students is only another sign of a larger movement—the absorption of knowledge by the masses, and its utilization by them in that ever-increasing struggle for existence in which a high premium has been put on mental equipment and ability.

With the movement—now widely known as University Extension—Cambridge has been closely identified since 1871, when Professor James Stuart urged strongly that Universities were not "local clusters of private establishments," but national institutions, and that they should seek to enlarge the scope of their intellectual influence. In the development of the same idea, the Cambridge University Press, an important department of the University which has itself a history of nearly four hundred years, has in recent times devoted itself to the production of books held by the University to be of permanent value. The addition to its catalogue of the *Encyclopædia Britannica* (11th Edition) is another step with the object of extending the influence of the University beyond academic, or local limits. The greatest work of reference, the repository of the widest research, the most useful book known to the Anglo-Saxon peoples, is now issued by an ancient institution of learning whose leadership in the world of science is unquestioned.

Carlyle's famous saying that the true University is a collection of books would have been nearer the whole truth had he said that the true University is a collection of books *issued by a University*, for books bearing the *imprimatur* of a great institution of learning are, from the nature of the case, good books, books worthy of a long life; in a word, books that are indispensable to correct knowledge.

The position of the *Encyclopædia Britannica* among works of reference has for more than a century and a quarter been one of undisputed pre-eminence, its prestige being due primarily to the fact that more than any other work of the kind it has sought to embody in its contents the broadest scholarship and the expert knowledge of specialist investigators in all fields of knowledge. To be invited to contribute to the work was, as the

**THE ENCYCLOPÆDIA BRITANNICA, 11th Edition.**

late Algernon C. Swinburne said, "the highest honour that can be bestowed on a mere man of letters."

Founded originally in 1768, and issued in Edinburgh by "A Society of Gentlemen in Scotland," it has been the pattern and the basis upon which all other encyclopædias have been built. Yet its own authority has never been equalled, nor has any other work even been suggested as approaching it in authority. The *Encyclopædia Britannica* has been the one work to which an Englishman or an American could have recourse in the eager pursuit of knowledge amid the multiplied and highly specialised activities of the modern era, confident that in its pages he would find the information he was in search of adequately set forth at the hands of an expert. As evidence of the popularity it has gained during a long and illustrious career, may be cited the fact that of the Ninth Edition alone between 400,000 and 500,000 copies, in one form or another (including mutilated, garbled and pirated American reprints), were sold.

## Editorial Expenses of the Eleventh Edition, £163,000 ($815,000).

The remarkable advances made in every field of effort during the last twenty-five years —discoveries which have involved a virtual reconstruction both in the premises and the conclusions upon which a large part of the knowledge of the early eighties was based—have necessitated a new creation from start to finish. *The editorial cost alone*—the sum paid to contributors, editors, and editorial assistants during the last eight years—has been £163,000 ($815,000), more than twice the literary cost (£60,000) of the Ninth Edition. Nearly all articles in the last edition have been superseded by new ones, and thousands of new headings, never before entered in the *Encyclopædia Britannica*, have been introduced. In those cases where a fresh survey, in the opinion of experts, could discover no better basis for an exposition of a subject than the article in the Ninth Edition or its Supplement, it has been carried forward with necessary alterations. Of the 40,000 articles in the new edition, 85 per cent. are entirely new, and 15 per cent. are traceable, with changes slight perhaps in extent, but often important in quality, to the old work. Thus the University of Cambridge feels justified in asserting with perfect confidence that the new *Encyclopædia Britannica* (11th Edition) constitutes the best and most conscientious treatment of universal knowledge the present day can afford.

## A Work of International Scholarship.

The scholars and specialists of the whole world have lent enthusiastic co-operation to the making of the new work; not Cambridge alone, but Oxford, London, Edinburgh, Birmingham, Paris, Berlin, Göttingen, Vienna, Kyoto; and in America, Harvard, Yale, Columbia, Johns Hopkins, Chicago, Pennsylvania, Princeton, Toronto—and many more—universities and centres of research everywhere have given their ablest minds to the preparation of a new and comprehensive summary of all that is known in every department of human knowledge in 1910.

In fact, one of the principal new features of the *Encyclopædia Britannica* (11th Edition) is that it is a work of international scholarship. The Editors of the 11th Edition have recognised that in the last twenty-five years there has been a closer communion of scholarly aims between the nations of the world, and a readier acceptance of the achievements of other countries than ever before. In a large sense, the whole civilised world is now one in thought, in intellectual sympathy, and in aspiration. The Editors have therefore approached their task in no merely national spirit, but in the spirit which recognises that scholarship to-day knows no nationality. For the first time an encyclopædia has been produced as a co-operative effort by the most competent authorities without regard to country. The 40,000 articles in the work have been written by some 1,500 contributors, representing the highest scholarship and the best practical knowledge of the twentieth century wherever these can be found. In pursuance of this policy, not British scholars alone, but the leading American, French and German authorities were enlisted as contributors.

## The 1,500 Contributors.

The quality of utility, an attribute of the *Encyclopædia Britannica* the attainment of which has been the inspiring motive of the Editors ever since the inception of the work in 1768, is inseparable from authority. There is but one method of assuring to any work of reference this essential authority—the em-



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ployment of the services (1) of *men of learning*—the original scholars who formulate great principles or develop important discoveries or master some one subject to which they have devoted special and long-continued investigation. In this class are university professors, scientists, philosophers, divines, historians, economists—independent thinkers who are themselves the source from which all that is known of a subject flows as a stream from its fountain-head; (2) of *men of action*—soldiers, sailors, men of affairs, jurists, administrators, architects, surgeons, artists, inventors, explorers, engineers, sportsmen, manufacturers, financiers—the men who apply their knowledge to constructive results in the every-day pursuit of their profession or vocation; and (3) of *practical experts* who are engaged in the advan cement of industrial undertakings for the welfare of mankind. The *Encyclopædia Britannica* (11th Edition), being first and last a repository of all knowledge, it is just as essential to its completeness and authority that it should give practical information about road-making, bridge-building, and ship-building, as that it should contain treatises on astronomy and geology—it should instruct the reader on oil-engines and the boring of oil wells and on the practical side of forestry, on the making of glass or paper, and on carpentry, not less intelligently than it expounds the Copernican theory and the philosophy of Hegel. As a matter of fact, what the general reader most often looks for in his encyclopædia is just this sort of practical information—information which it may be he can turn to immediate profit, but cannot obtain from any other source. On its purely practical side—the massing of exact knowledge covering every kind of activity to which the genius of modern industry has been directed—the new *Encyclopædia Britannica* is a veritable storehouse of the latest information, the editors having been not less careful in selecting the leading experts to write articles of a utilitarian character than in choosing writers of articles of a purely theoretical sort.

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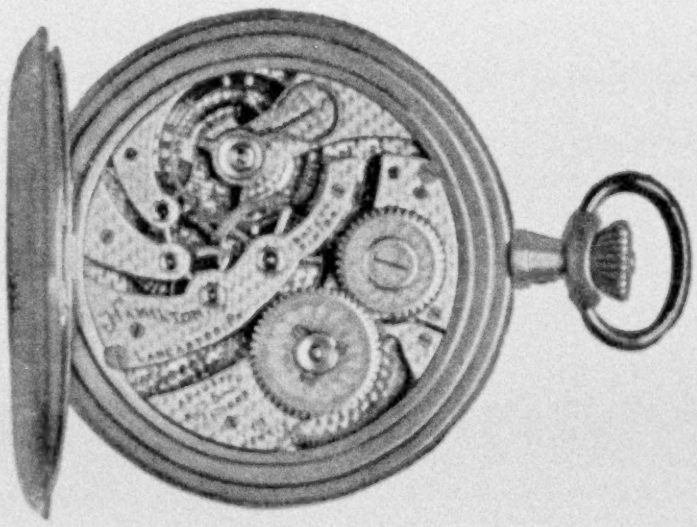

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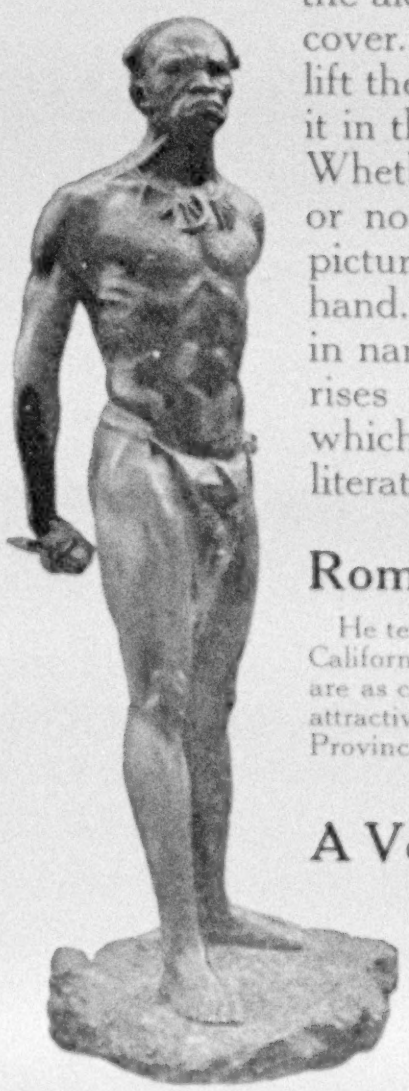

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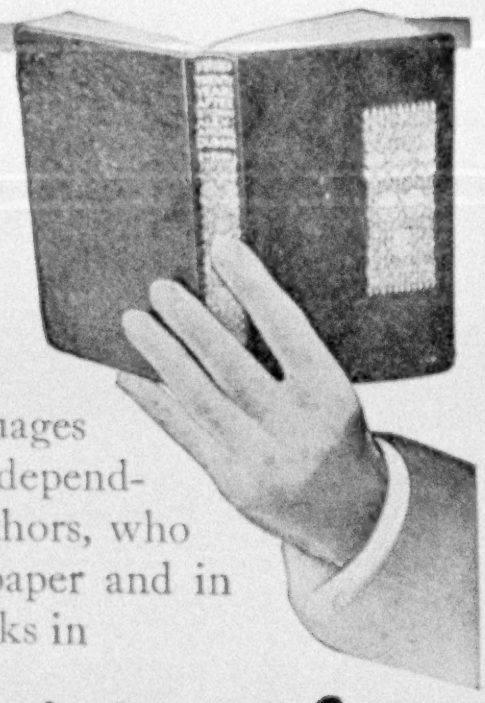

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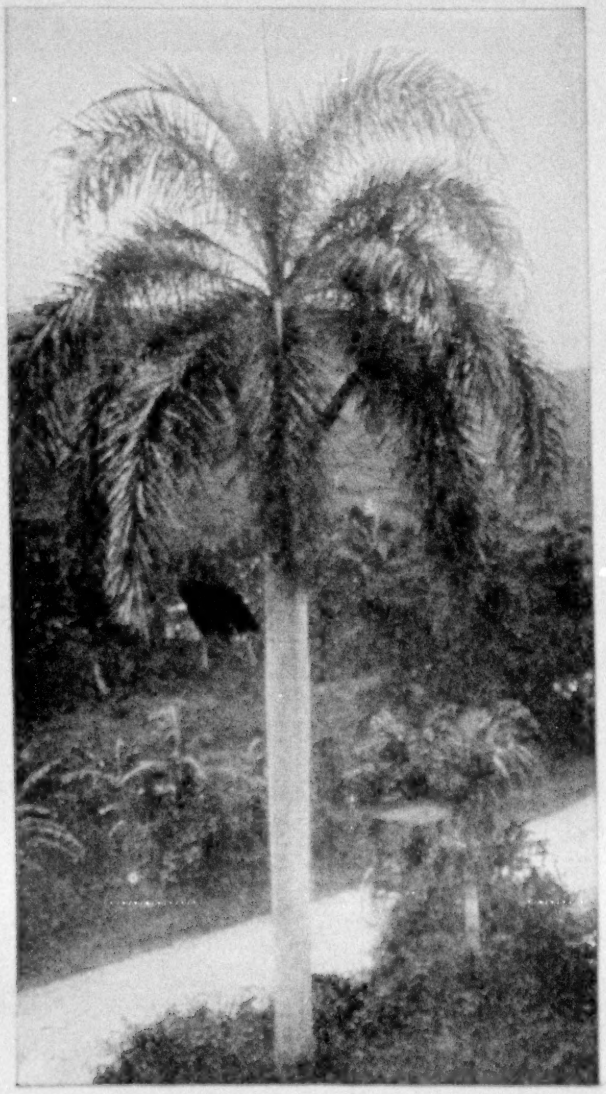


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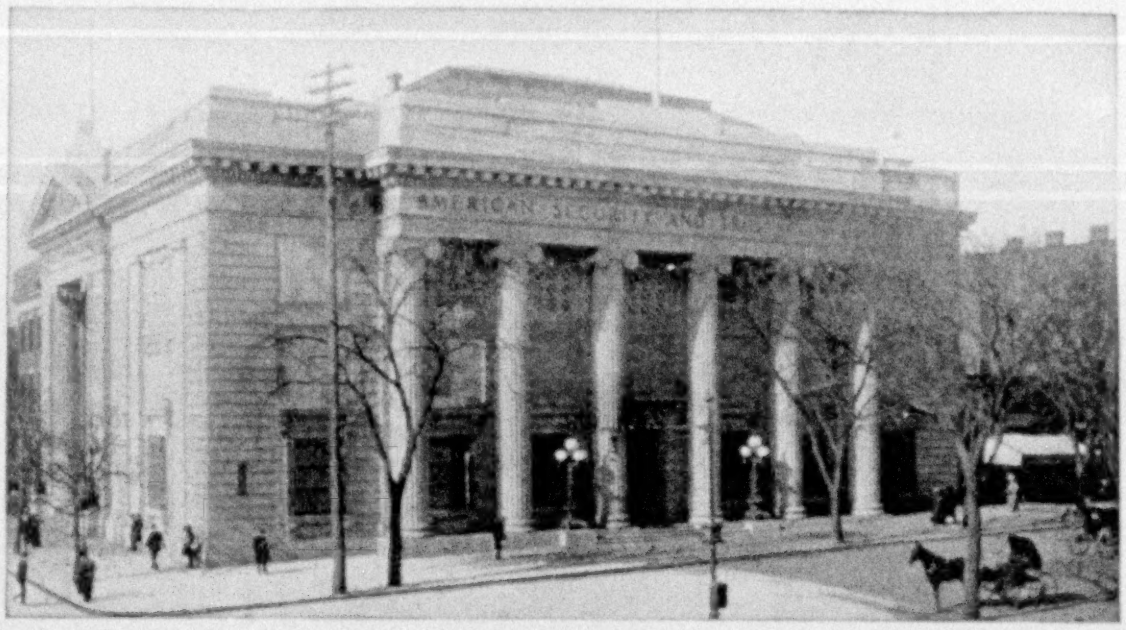

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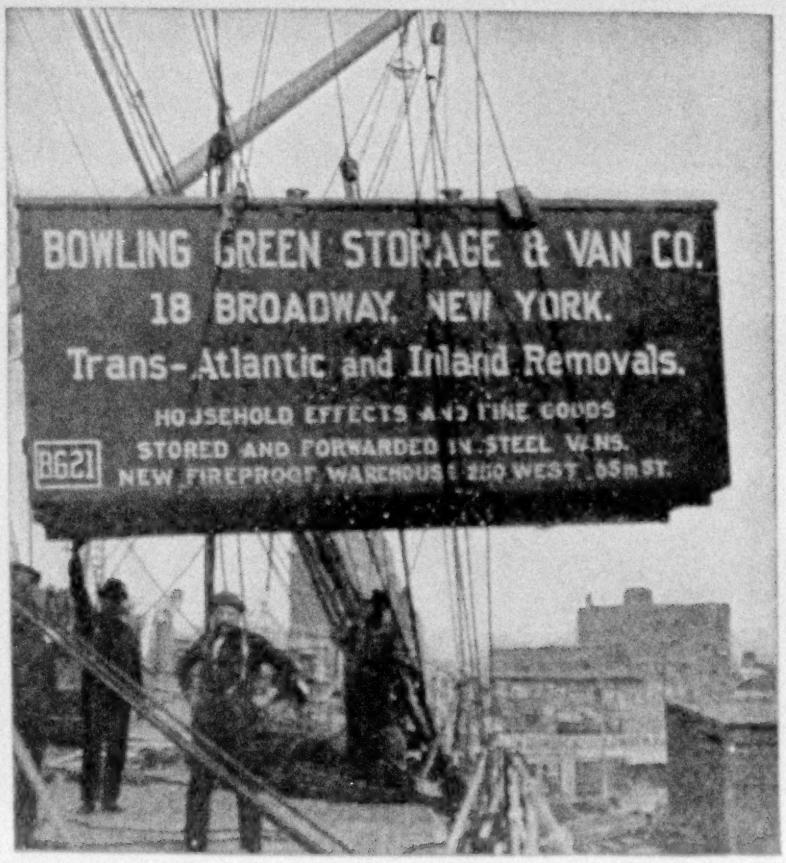


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VOL. XXI, NO. 11 WASHINGTON NOVEMBER, 1910

THE NATIONAL GEOGRAPHIC MAGAZINE

# GLIMPSES OF KOREA AND CHINA

BY WILLIAM W. CHAPIN, OF ROCHESTER

*With Photographs by the Author*

KOREA, the little nation which has been so carefully watched by the Powers during the past few months as she has been undergoing the process of being taken over by her powerful neighbor, Japan, is, considering the rapidity of the changes through which she has passed within 30 years, a country of unusual interest. Comparatively little was known of her prior to 1882, as up to that year she was a hermit nation, satisfied with her own resources and conditions, only anxious to be left undisturbed. Indeed, previous to that date, it is said to have been death, not alone to the foreigner who landed on her shore, but to the native who gave him shelter.

A land so oriental, full of unusual scenes, and customs so strange, but recently opened to the safe inspection of foreigners, and withal so accessible to travelers in Japan, furnished considerations which impelled us to brave the perils of the Korea Strait and embark from Shimonoseki for Fusan.

Our ship was to sail at 9 in the evening, and the promptness after we boarded the steamer with which we sought our berths proved that the rumors which had come to us regarding the discomforts of the rough passage were thoroughly believed. On awakening several hours later, as we glanced from our porthole at the gentle rippling surface of the sea, sparkling in the glory of the full moon, a scene so at variance with the conditions we had expected, our first thought was that we were in a dream.

The long dock at which our steamer landed at Fusan was alive with people, most of them coolies, in white clothing and with long hair in an untidy coil, worn on top of their heads, waiting to transfer our baggage to the railway station, half a mile distant. This is done by means of peculiar racks carried on the back, in which not only baggage is borne, but every conceivable thing, even to live animals. Were the tourist to journey to Fusan alone, he would feel amply rewarded for visiting this gateway city, even if the crossing proved as rough as is sometimes experienced.

One can hardly realize that such a change of scene is possible after only 10 hours of steamboat travel: the people, their occupations and habitations, not to mention their wearing apparel, the dress of the men and the undress of some of the women—all being most remarkable. One of the attractions of this city is the

fish industry. The early morning catch is transferred to the docks, where the fish are sorted and disposed of either by sale or packing for shipment. In this work the native women take an active part.

In approaching the station we passed a section of the highway where grading was being done. The earth was first loosened by a queer implement—a hoe with long flat prongs—in the hands of men whose dusky forms were nude to the waist. Others were operating a three-manned shovel, a tool peculiar to this country, being a long-handled scoop from which two ropes extended. While the one holding the handle guides the implement, the two others furnish the power by pulling the ropes from a distance of about 12 feet. Judging from the results of their united efforts, it would require several to accomplish as much as could one able-bodied son of Italy, armed with an ordinary shovel and wheelbarrow.

The railroad of Korea, like most of those of Japan, is owned and operated by the Japanese government. The train which conveyed us northward much resembled those in our own land, and included a dining-car. The line follows for a long distance the course of the Raqutoka River, passing through several tunnels, some of which are of considerable length. The door-yards and houses seen from the car windows are surrounded by substantial stone walls, and, judging from the appearance of the numerous groups of children, tan-colored undressed kids were quite in style.

Before reaching the principal towns, train-boys passed through the cars informing each passenger that the train would stop so many minutes at the next station. On arrival, a rush was made by the passengers, mostly Japanese men and women, to the long wash benches at one side of the depot, which were provided with basins and running water. And the way they would souse their arms and faces, the men including their hair and necks, revealed a new trait in these little people.

Hot tea was furnished gratuitously and four times during the day was passed in cups on trays through the cars, to take the place of the ice-water tanks with which American coaches are equipped, for it is unsafe to drink unboiled water here as in Japan.

Along the route of the railroad, trees are very seldom seen and no apparent effort is being made to reforest; indeed, a tree in this country stands but little chance, even the branches to the smallest twigs being tied in bundles of uniform size, the roots, too, dug up, and all loaded on the backs of men or oxen, brought to market, and sold at so much per pound. A frequent object seen on the streets of Seoul is a mass of brush moving slowly along, it sometimes being difficult to determine by what motive power, so obscured is the animal by its load.

At a suburban station our car was entered by a nice-looking native, wearing the dress of the better class, who, in well-spoken English, solicited our patronage for the "Astor House," Seoul, Korea. At once visions of sumptuous repasts and faultless service enjoyed years since in lower Broadway arose in our minds and we decided to locate there. Upon inquiry we learned that the gentleman's name was "Sin Song," and that representing the hotel occupied his time only when he was not employed as courier for tourists; so, on the strength of appearances, his services were at once engaged for our entire stay, and we were most fortunate in our choice, as he proved satisfactory in every way. As an evidence of the enterprise of the young man, I will state that, although a Romanist, he was a member of the local Young Men's Christian Association, which has an attractive building and is in a prosperous condition.

Before visiting the points of interest in Seoul, which is the seat of government, let us consider briefly some facts pertaining to Korea as a country. Korea, although usually considered a peninsula, is in reality an island, 175 miles of its northern boundary being the River Yalu and the remainder the River Turnen, both of which are outlets of the same lake in the Northern Mountains, the

THE THREE-MAN SHOVEL: FUSAN, KOREA (SEE PAGE 896)

GRADING NEAR THE HIGHWAY: FUSAN, KOREA

KNEADING BREAD ON THE STREET: SEOUL, KOREA (SEE PAGE 902)

former flowing west and the latter east. The dimensions of Korea are about 135 by 600 miles, with an area, including its numerous small islands, of about 100,000 square miles—not far from the size of New York and Pennsylvania. The arable land comprises only about one-quarter of its surface, a range of exceedingly barren mountains and scantily clad hills extending its entire length. Its population, estimated from the number of houses on which taxes are paid, is 12,000,000, or 159 to each square mile. As a comparison, that of England is 500; Japan, 284; Germany, 250, and the United States 21. The climate is about the same as New York and Pennsylvania, excepting a season of six weeks of the wettest kind of rain.

Raising of rice is the chief occupation of the people, although Korea is said to be the fifth largest cotton-producing country in the world. In customs and looks the people resemble the Japanese in some ways, and although they have many noticeable peculiarities, laziness, as some writers have charged, is not one of them. Many varieties of fruit thrive and the country is rich in coal and nearly all mineral products.

White clothing is the emblem of mourning in Korea, as it is in Japan and China; the mourning period is three years. On the occasion of the death of a royal personage the entire population must put on white. This custom is said to be accountable for the people having adopted white clothing for ordinary wear, that they might be ready for the inevitable when it should come, either in their own or in the royal family.

The distinguishing feature in the clothing of the male Korean mourner is the material, which is unbleached linen or sackcloth bound at the waist with a rope girdle for the loss of a father, or one made of strips of cloth for a mother. In his hands the mourner holds a sackcloth screen about one foot square, with which to hide his face when passing along the

street. The mourning hat, while enormous, must be much more comfortable than the every-day fly-trap sort. It consists of a creation of straw and bamboo, shaped like a wooden chopping bowl, the edge of the rim being a coarse scallop, which distinguishes it from the one worn by peasants. The mourning hat as a setting for the solemn oval face of a Korean produces an appearance of extreme sadness.

The conventional clothing of the men is more striking than comfortable, as was demonstrated by my having a complete suit made to order. The foot is crowded into a cloth stocking not the shape of the member it is designed to fit, but, like the shoe, narrow at the toe and turned up to a point similar to a clown's foot covering. The dry-weather shoes, of coarse black cloth, low as slippers, their snug fit being depended upon to hold them in place, were found extremely uncomfortable.

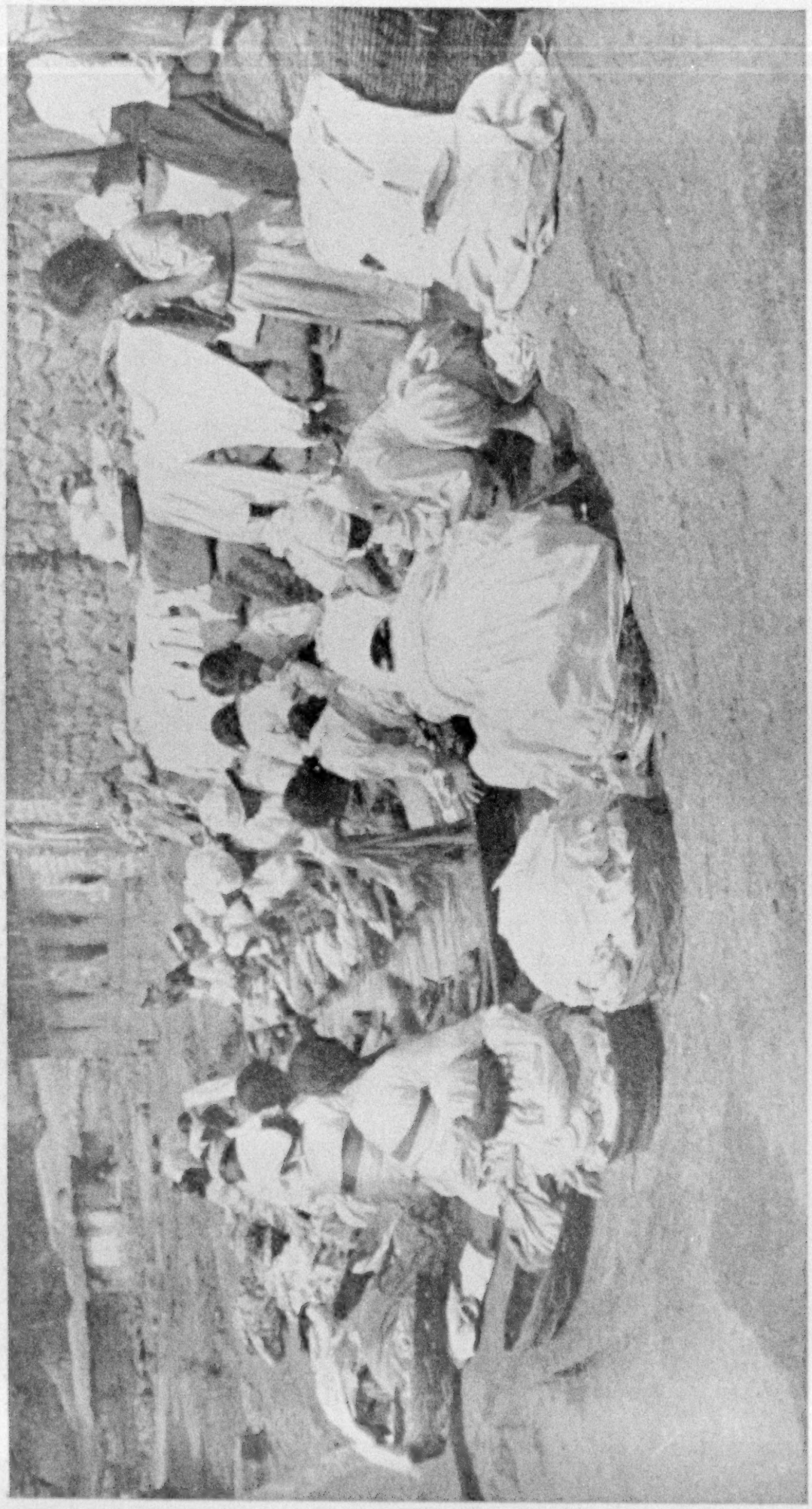
The trousers consisted of a pair of pillow-cases having a wide waistband, not too uncomfortable in warm weather were there some other arrangement for holding them in place less confining than the narrow braid which is used as a belt. The padded waist is covered with a green silk waistcoat, the long unlined overgarment being of thin, gauzelike material, almost transparent, in a delicate blue, reaching below the knees. From the belt on the left side are hung two cases, one containing a small knife and a pair of chop-sticks, the other a pair of grotesque spectacles of smoked glass the size of silver dollars, set in a clumsy bone frame. On the right hang bags for money and tobacco. All of these cases are embroidered in bright colors.

In the hand is carried a plain fan, while the outfit is crowned by an absurd little pill-box hat, which, when worn by a native, is perched on a tightly-coiled queue and tied under the chin with a plain black tape, supplemented in the case of men of wealth or distinction by a chain constructed of two-inch pieces of the smallest-sized bamboo separated by amber beads, hanging from either side of the hat, under the chin and thence to the waist. The rim of the hat is of fine bamboo, while the upright part is of horsehair, so loosely braided as to expose the hair of the wearer to view. For rainy weather they have as a covering for the hat a peculiar round, helmet-shaped oil-skin, pointed at the top, which is drawn on and tied under the chin. When not in use this covering is folded in pleats like a fan and carried in the folds of the waistcoat.

The clothing of the wealthy Korean is of the same cut, but differs from the above simply in cost of the material; the coat being of silk and the hat of finer weave, the latter sometimes costing $20. The coolie and laboring element wear similar clothing in shape as those in the upper classes, but of a cheaper material and without waistcoat and over-garment. In place of the hat a head-cloth is sometimes worn covering the hair, the corners being turned upward above the forehead; most of them, however, wear only the queue coiled on top of the head.

The dress of the laboring class of women consists of a jacket or waist which extends about three inches below the armpits, while the skirt has only a tightly drawn band, thus exposing to view several inches of dark-brown skin between the waist and skirt-band. This condition seems more unaccountable, since women of the middle class never appear on the street without wearing a white skirt over the head and face in such a manner as to enable them to see their way without exposing even their faces to view, while others wear a green or red long-coat, hung in the same way and reaching to the knees; this garment, although having sleeves, is only worn as a veil. The higher, wealthy class of women never appear on the street except within the seclusion of the closely curtained chair borne by coolies.

In place of the street covering for the head, some of the reformers carry open umbrellas both in daylight and darkness, not as a protection from rain, but as a screen from the gaze of the naughty men. This seems rather amusing, since



THE WASHERWOMEN OF SEOUL, KOREA, WASHING IN THE SEWER (SEE PAGE 902)

THE BULLOCK—THE BEAST OF BURDEN OF KOREA

the purpose for which men carry fans is said to be to protect them from the eyes of the women. In their home life the women wear very bright, solid colors, without regard for harmony, waist, skirt, silk purse, and other ornaments being all at variance.

If a tourist flatters himself that he has escaped the lure of the curio dealer by crossing into Korea, he will soon discover it to be a case of jumping from the frying-pan into the fire, as some of the old brasses offered here at "ruinously low prices" are most attractive. Much of the work is crude and coarse, but when one sees the tools and the manner of handling them, the wonder is that such good results are obtained. The articles offered include oak chests and cabinets, almost entirely covered with brass plates, hinges, and trimmings. The former are locked with great padlocks of antique design, nearly as large as some of those seen on the gates of the walled cities. Braziers, vases, incense-burners, tea-kettles, and the high candlesticks peculiar to the country are among the smaller articles for sale. By exercising great care, our Sin Song secured for us a fine specimen of a cabinet and chest guaranteed antiques. As the stock of genuines is getting low, these wily craftsmen are offering recently manufactured close imitations of the old models, so the tourist without experienced assistance is at their mercy.

One of the first objects of interest we visited was the public park, an enclosure filled with fine trees, flowering shrubs, and roses in variety. It was such a place as would do credit to any country, with its well-kept lawns and tea-house of handsome outlines standing near the white marble pagoda. The latter structure is unlike those bearing the same name in Japan, being more the form of an octagon, with the shaft ornamented its entire length with carvings. It was erected 1,600 years ago as a monument to Buddha. In 1580 the top, comprising about one-quarter of the whole, fell, and now stands close beside the main part.

A few steps beyond and placed here at the same time is another monument, designed like an enormous turtle, the emblem of longevity. It is cut from one stone, bearing a tablet on its back. After a close examination it appeared so

well preserved that one of our party exclaimed that it did not look a day older than 1,599 years.

The main streets of Seoul are wide and well laid out. The stores generally are but one story, hardly deserving the title of buildings. On a pleasant day these thoroughfares present a very animated scene, the white clothing giving a prominence to each wearer, bringing him into view as far as the eye can reach. The means of conveyance over the roads, for the most part unpaved, is rickshaws drawn by boys who are swift and tireless. On one side of the main street were double tracks of a dilapidated horse-car line, which with the electric light and telegraph poles were evidence that intercourse with outside nations had not been without advantage.

The street scenes of Seoul offer great variety for the kodak, the burden-bearers of both sexes furnishing a constant change of scene; most of them being willing victims, entirely satisfied with a small tip. At the wood market on one side of the main street the patient steer is seen reclining under the weight of a load of logs which would cause a wagon to groan, and one wonders how he will ever regain his footing when his master makes a sale and the time comes to deliver the goods. These animals appear to thrive under their burden-bearing, being sleek and well kept.

At a turn of the road we encountered three coolies, each bearing a live pig, which must have weighed twice as much as the coolie himself.

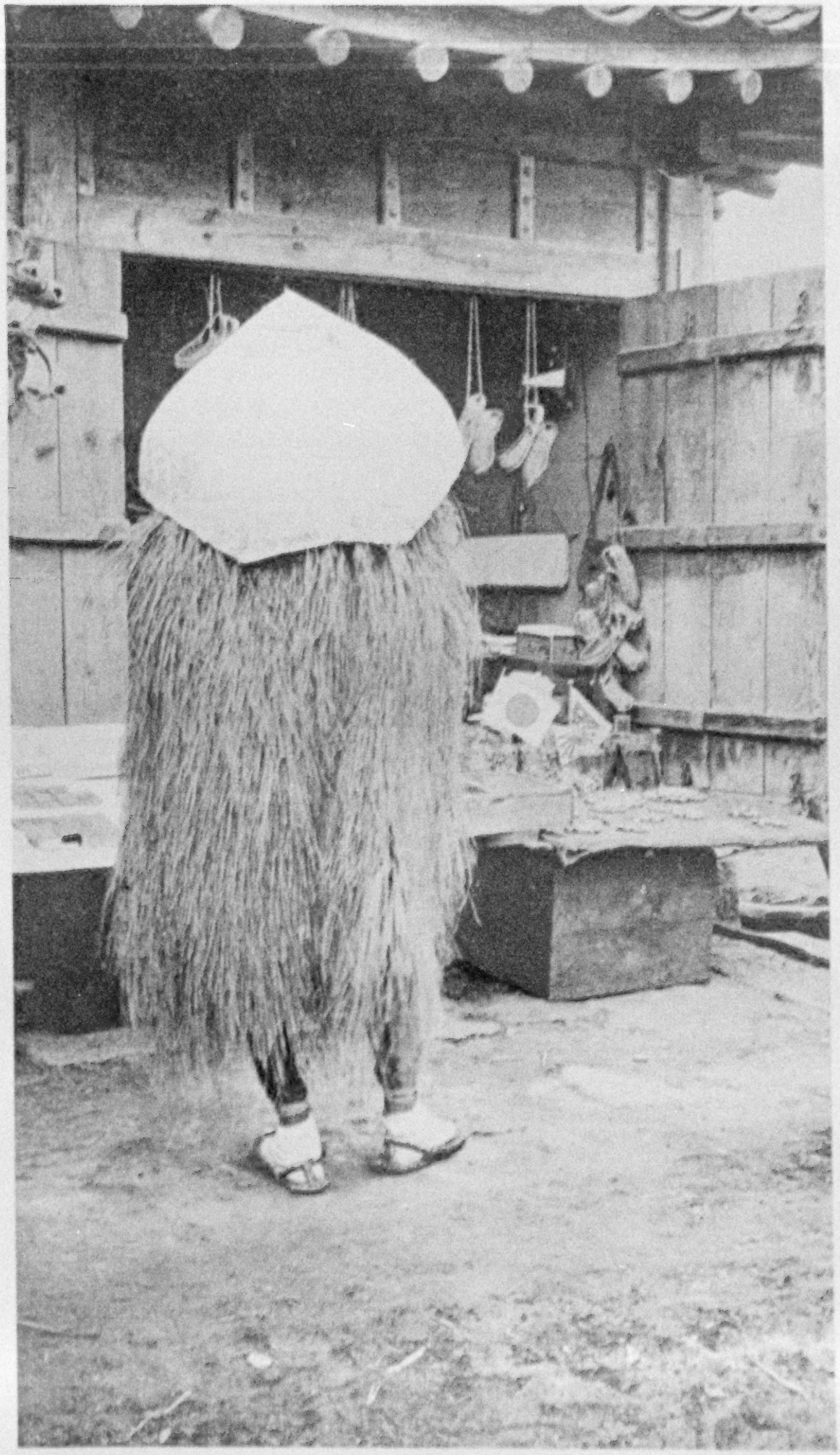
The guardians of the peace were much in evidence, and in place of carrying the usual locust club they were armed with swords. Frequently one or more of these policemen were met preceded by from two to six culprits chained to each other by the waist, carrying tools for cleaning or repairing the streets, en route to some part of the city where they were to work.

The native bread of Seoul does not seem very attractive to foreigners after they have seen the process by which it is made. However, if its excellence was alone dependent on the thoroughness with which it is kneaded, the bread which "mother used to make" would suffer by comparison. After mixing, the dough is placed on a board in the road in front of the little bakeshop. Then two stalwart Koreans proceed to pound it with great beetles. It is not claimed that the quality of the bread is improved by the addition of impurities in the way of insects and dust which naturally result from the open-air treatment, but if one objects to eating it, a native will quote a proverb which, being interpreted, runs, "He who would enjoy his food should not look over the kitchen wall"—a maxim not without force in countries occidental.

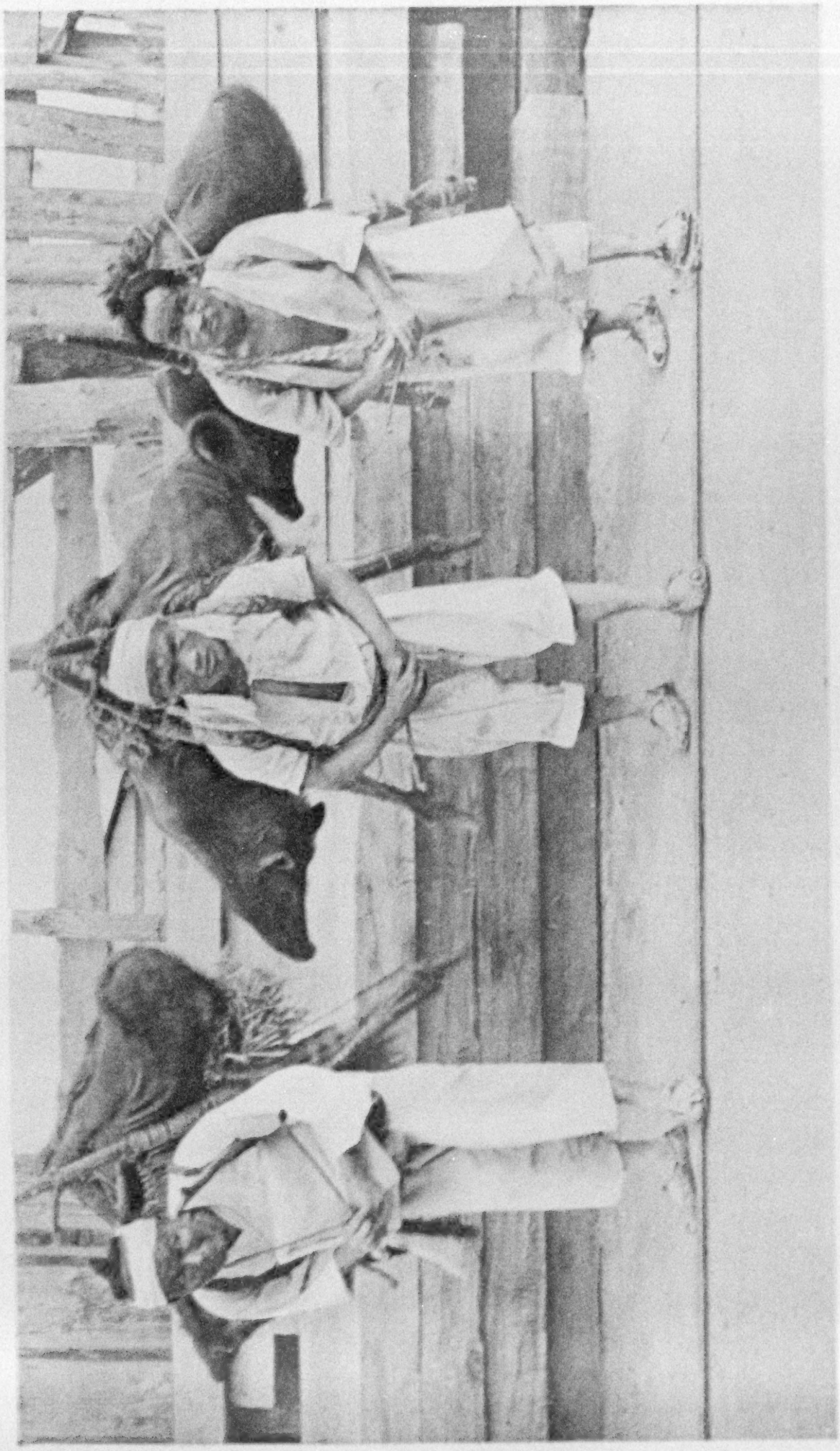
The poor, neglected children seen on the streets and in the courts without a stitch of clothing to cover their dusky little bodies enlisted our sympathies. We recall one baby boy in particular to whom the accomplishment of walking alone was so new that he toddled with uncertain steps across the narrow road, and while attempting to gain the sidewalk rolled into the shallow ditch. Although in a decidedly soiled condition, he picked himself up and made his way toward where we were waiting to kodak a woman who was approaching bearing a basket on her head. The result was that they both reached the spot at the same instant that the bulb was pressed. We returned the youngster to his home with thanks.

The temples visited in the region of Seoul were found to be very ordinary and much neglected.

The occupation of laundress in this land, where the clothing of both men and women is white, of necessity employs large numbers of women. The seamstress, too, must have plenty to occupy her time, since most of the garments are taken apart at the seams before washing. Almost a daily sight was bevies of women lining both sides of small drains or sewers occupied in washing clothes. While not neglecting the object of the gathering, they were not unmindful of its social features, singing, chatting, and laughing to the accompaniment of the flat clubs, as they



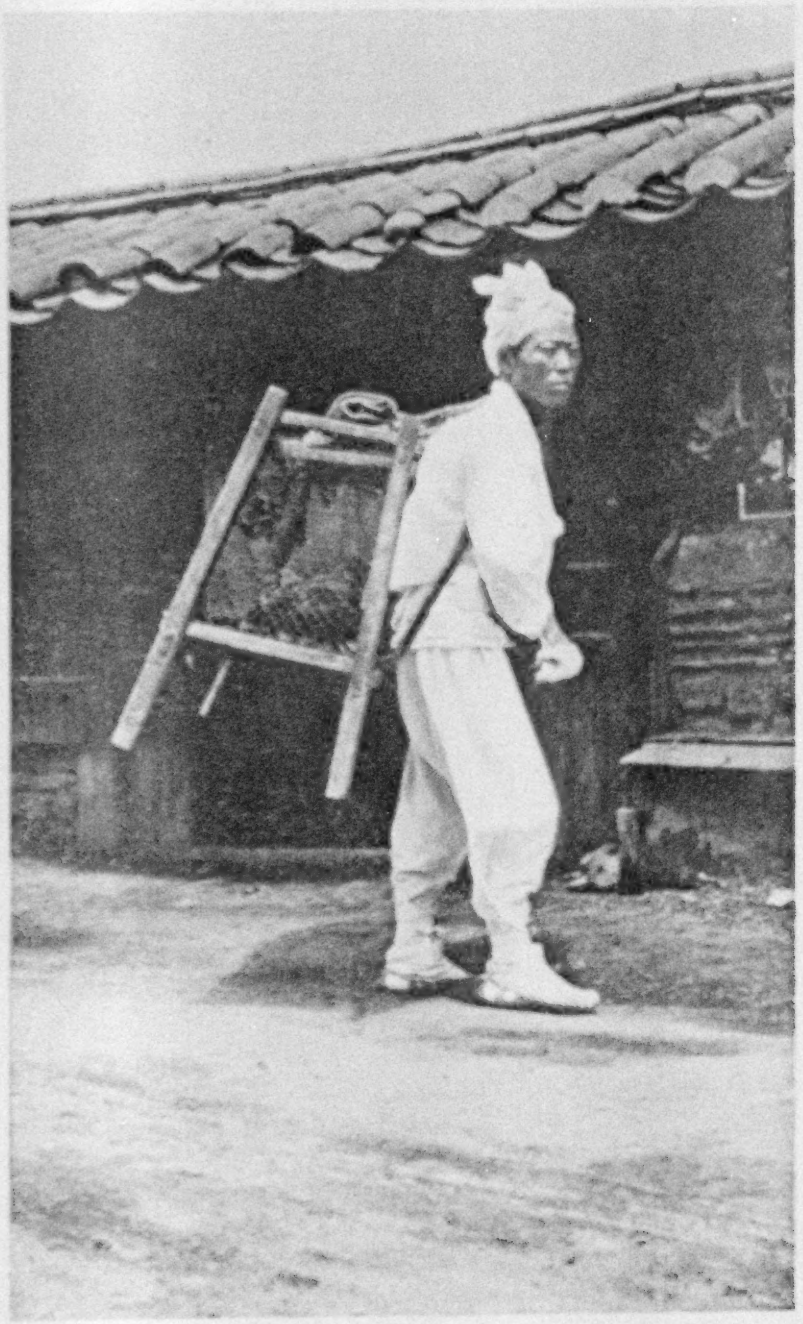
PEASANT IN RAIN-COAT AND HAT: SEOUL, KOREA



CARRYING SWINE TO MARKET: KOREA

THE WOOD MARKET: SEOUL, KOREA

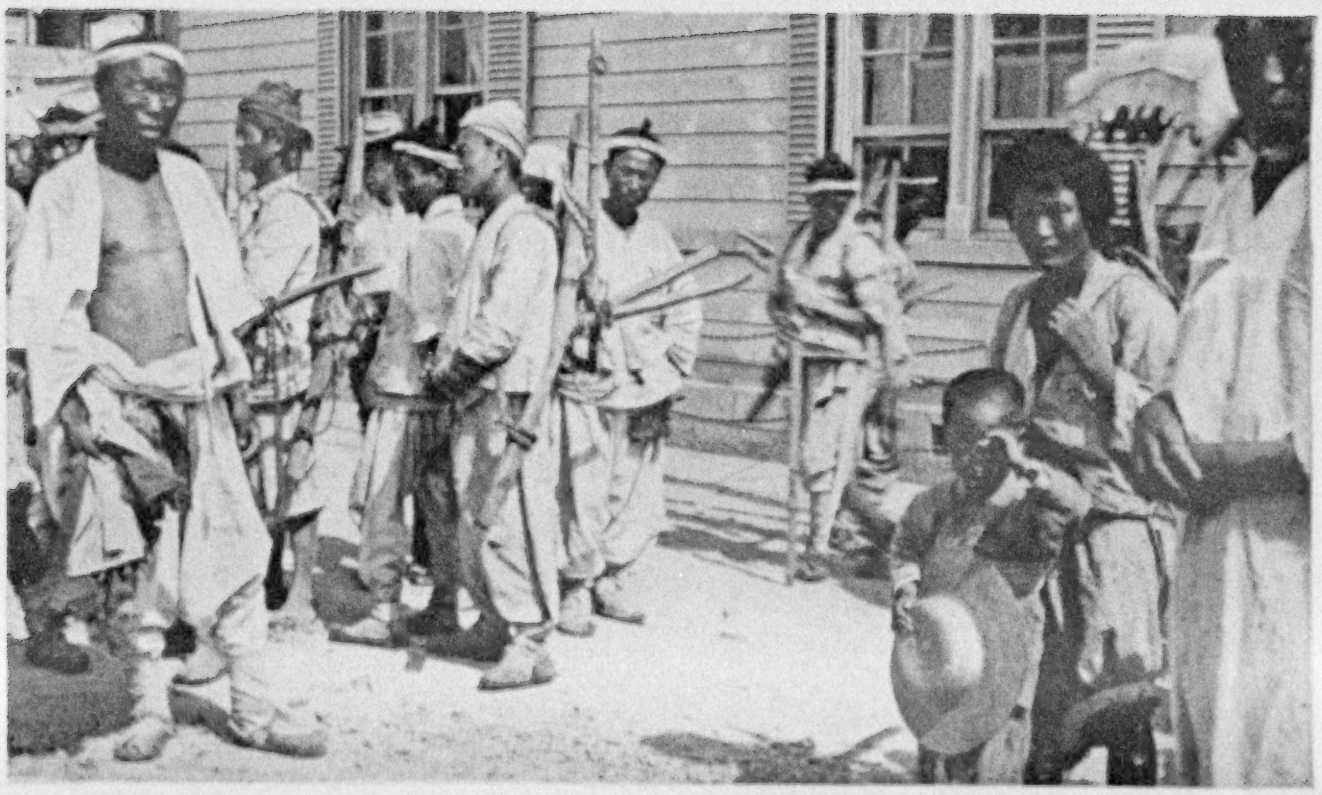
THE TIMBER MARKET: SEOUL, KOREA



POULTRY PEDDLER: SEOUL, KOREA

PEASANT WOMAN: SEOUL, KOREA

KOREAN LABORING WOMEN: SEOUL, KOREA



KOREAN COOLIES
(Showing racks for carrying baggage, as seen on arrival of ship at Fusan, Korea.)

KOREAN GENTLEMEN

XUM

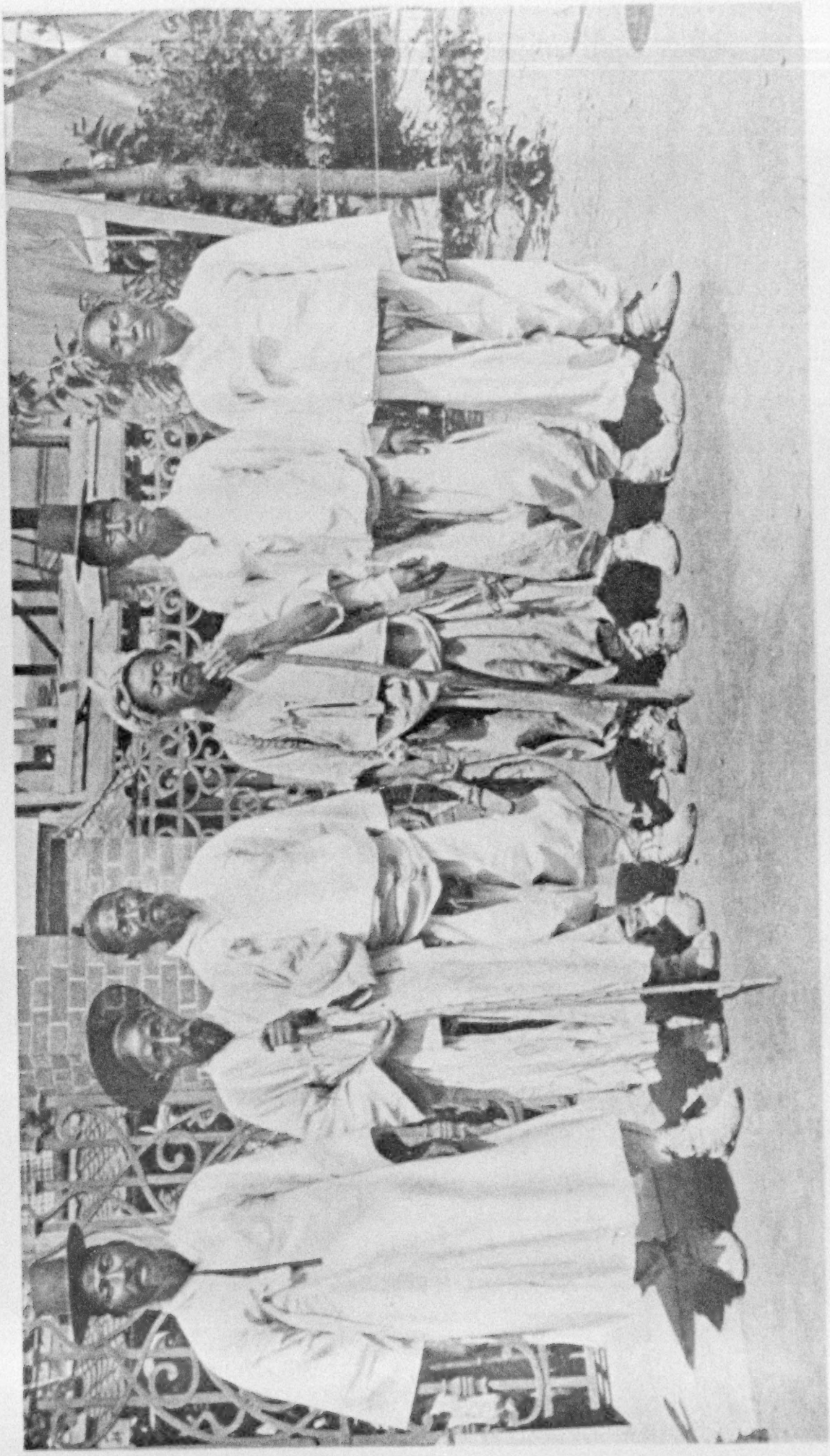
BUDDHIST NUNS: NEAR SEOUL, KOREA

A LOAD OF BOTTLES: SEOUL, KOREA

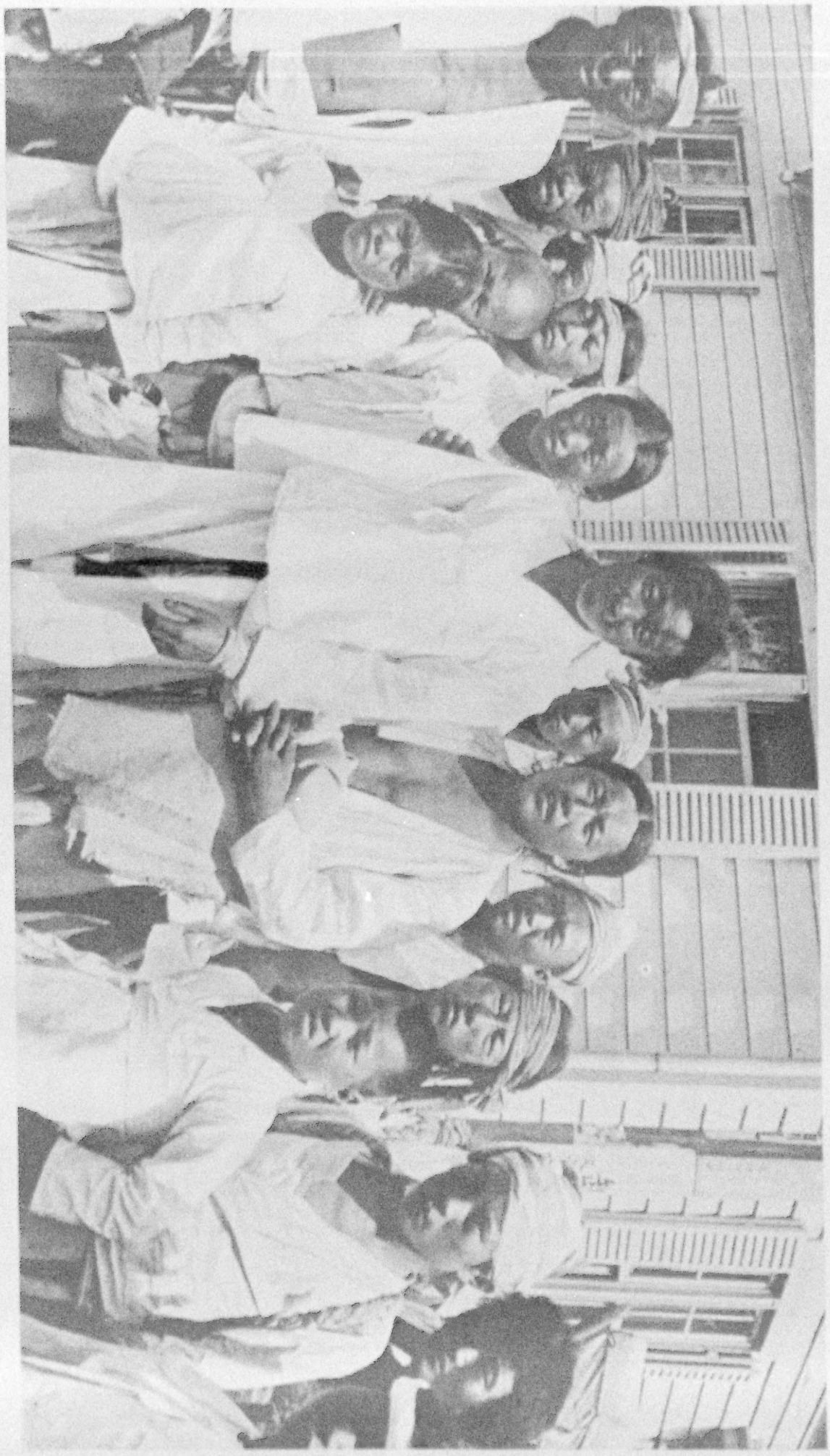
THE LAUNDRESS AND STREET BABY: SEOUL, KOREA

POTTERY CARRIER: SEOUL, KOREA

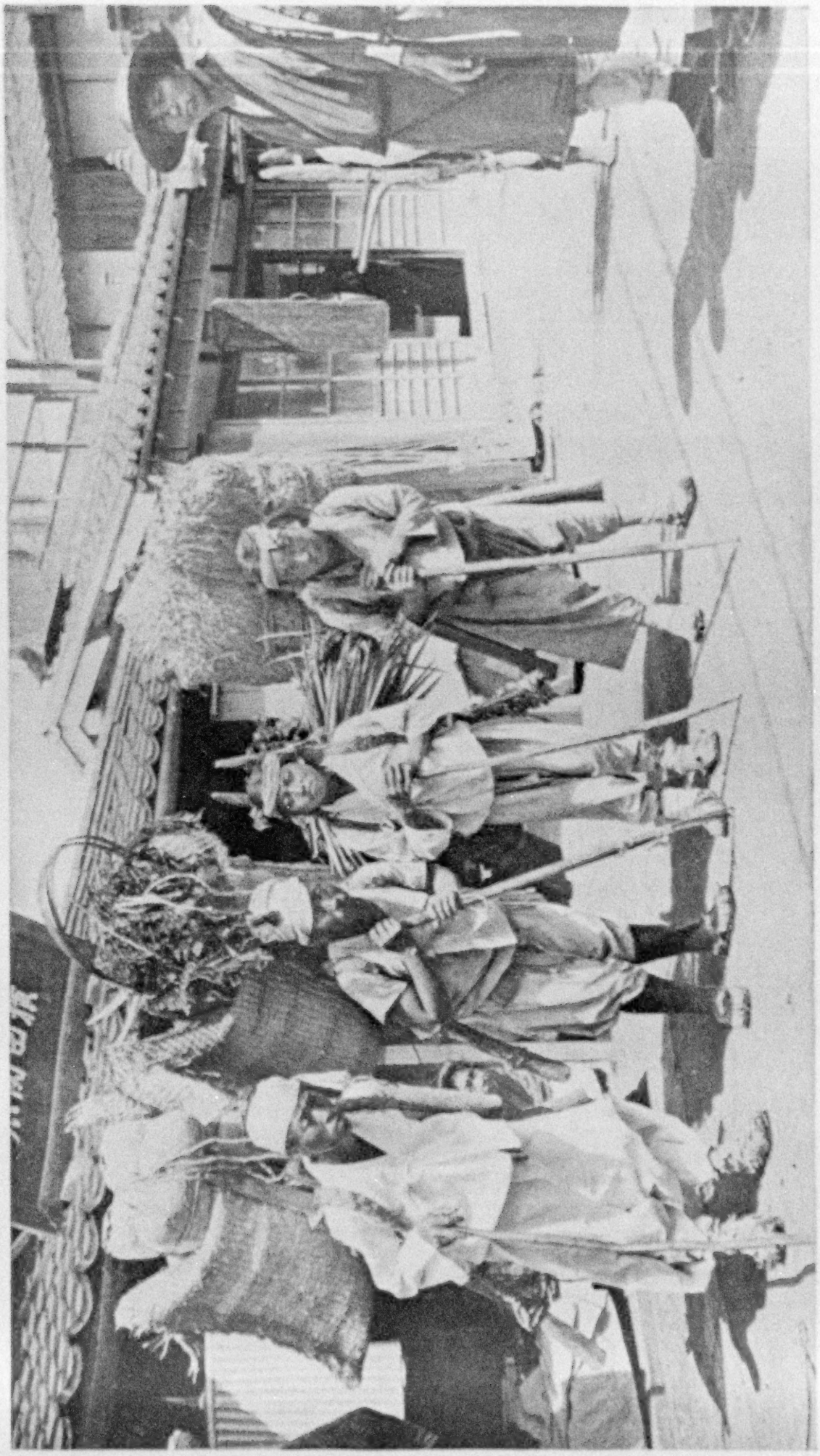
PEASANTS: SEOUL, KOREA
(Street scene.)



KOREAN CITIZENS: FUSAN, KOREA
(Group inside Municipal grounds.)



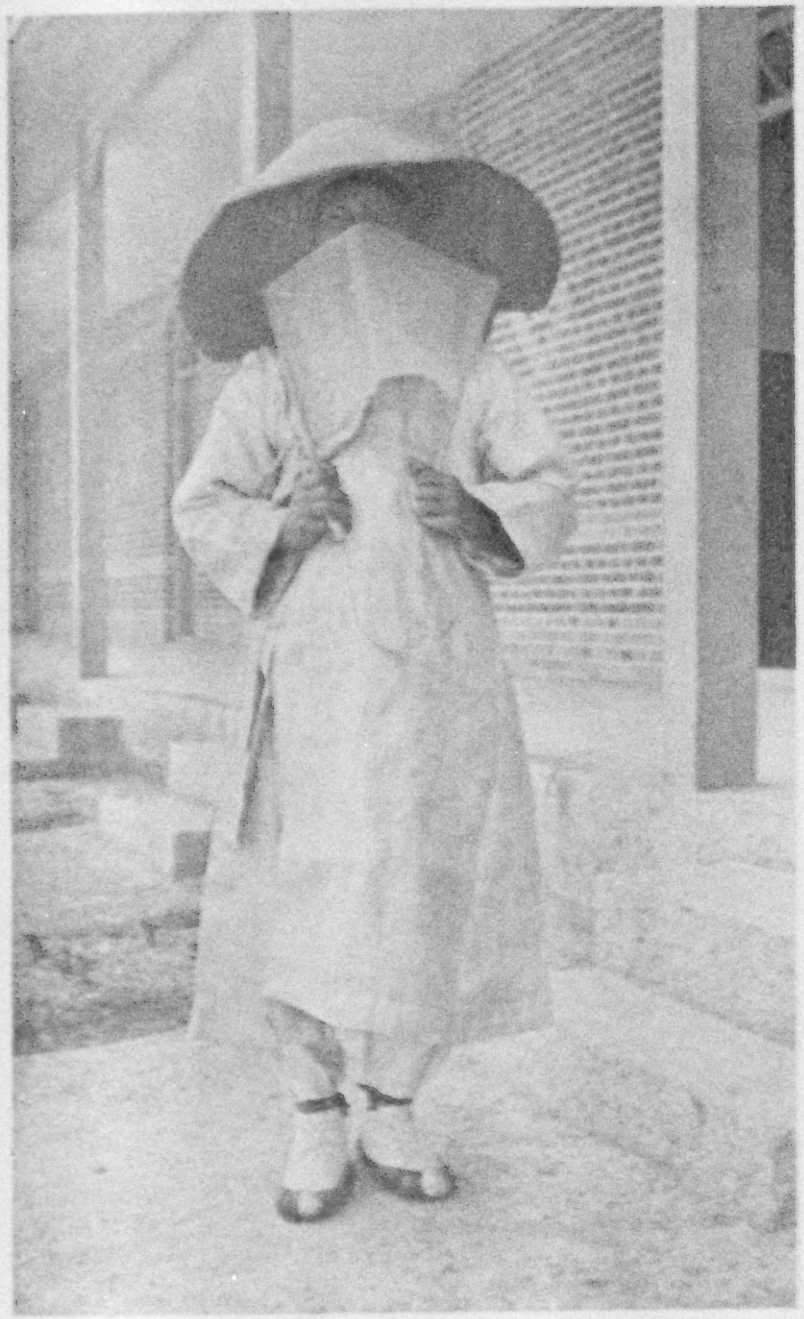
KOREAN COOLIES: FUSAN, KOREA
(Boys at the dock.)



BURDEN BEARERS: STREET OF SEOUL, KOREA

HIGH-CLASS WOMAN'S CHAIR: SEOUL, KOREA

FUNERAL CAR: SEOUL, KOREA



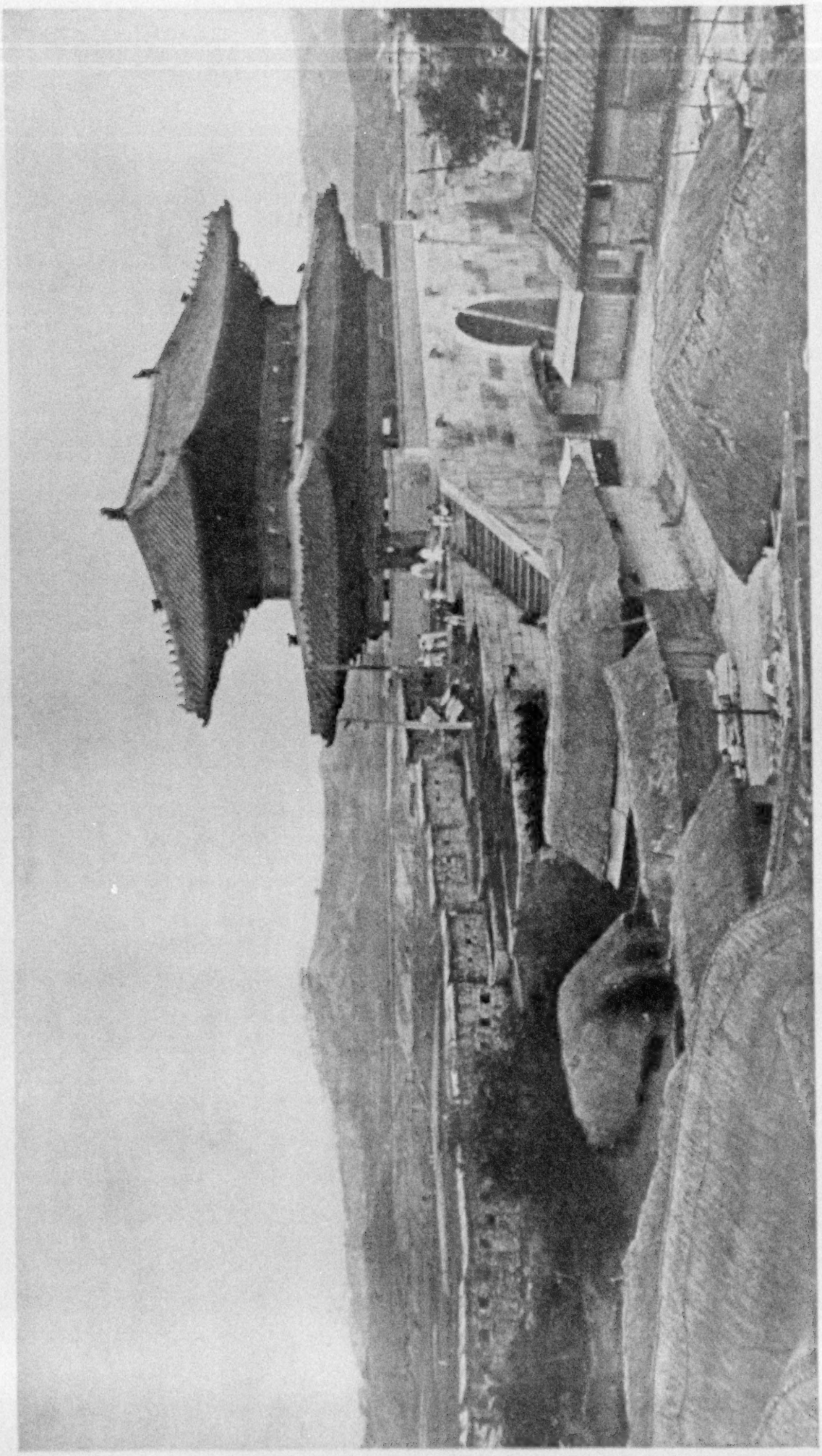
KOREAN MOURNER
(Holding face-screen.)

AS WE LOOK IN KOREAN GARB

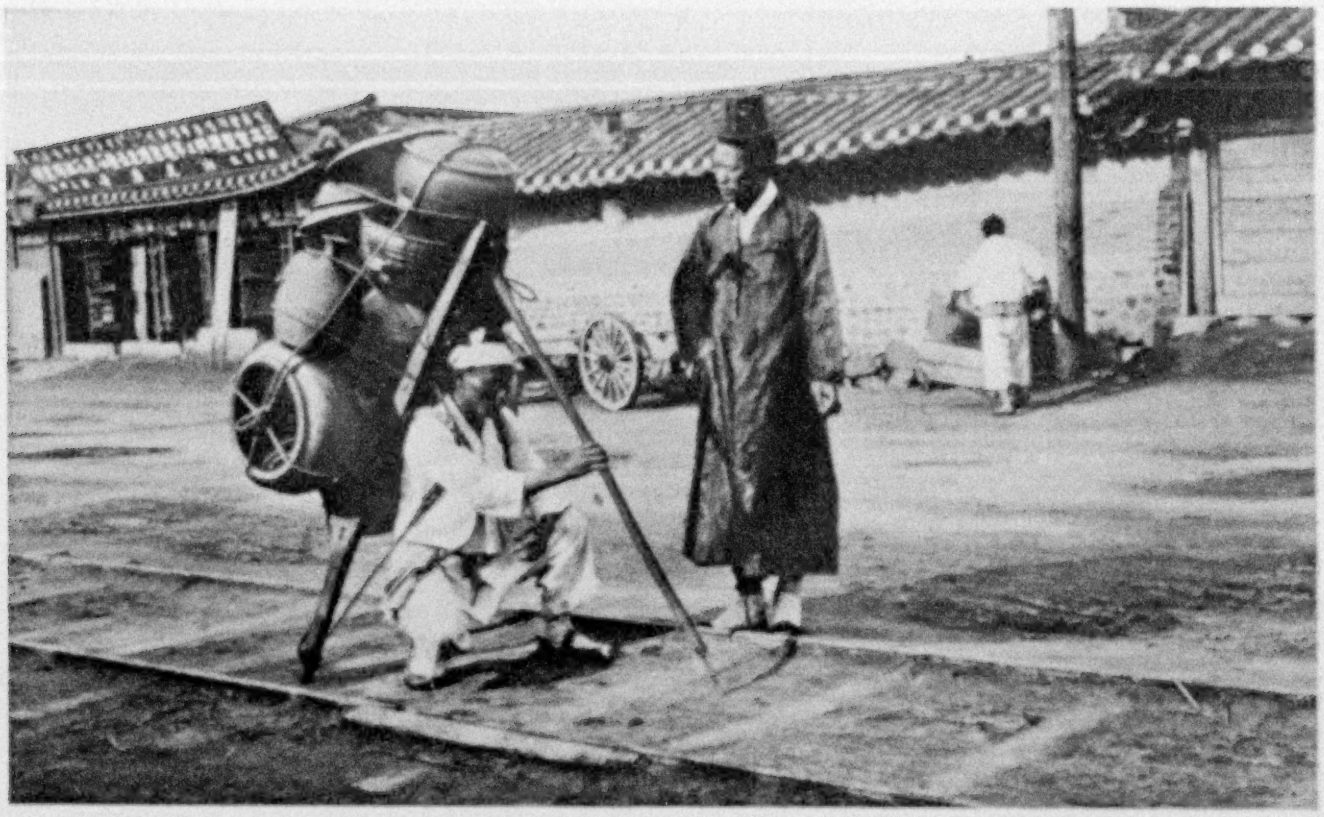
THE WHITE BUDDHA: NEAR SEOUL, KOREA

GUIDE SIN SONG AND FAMILY

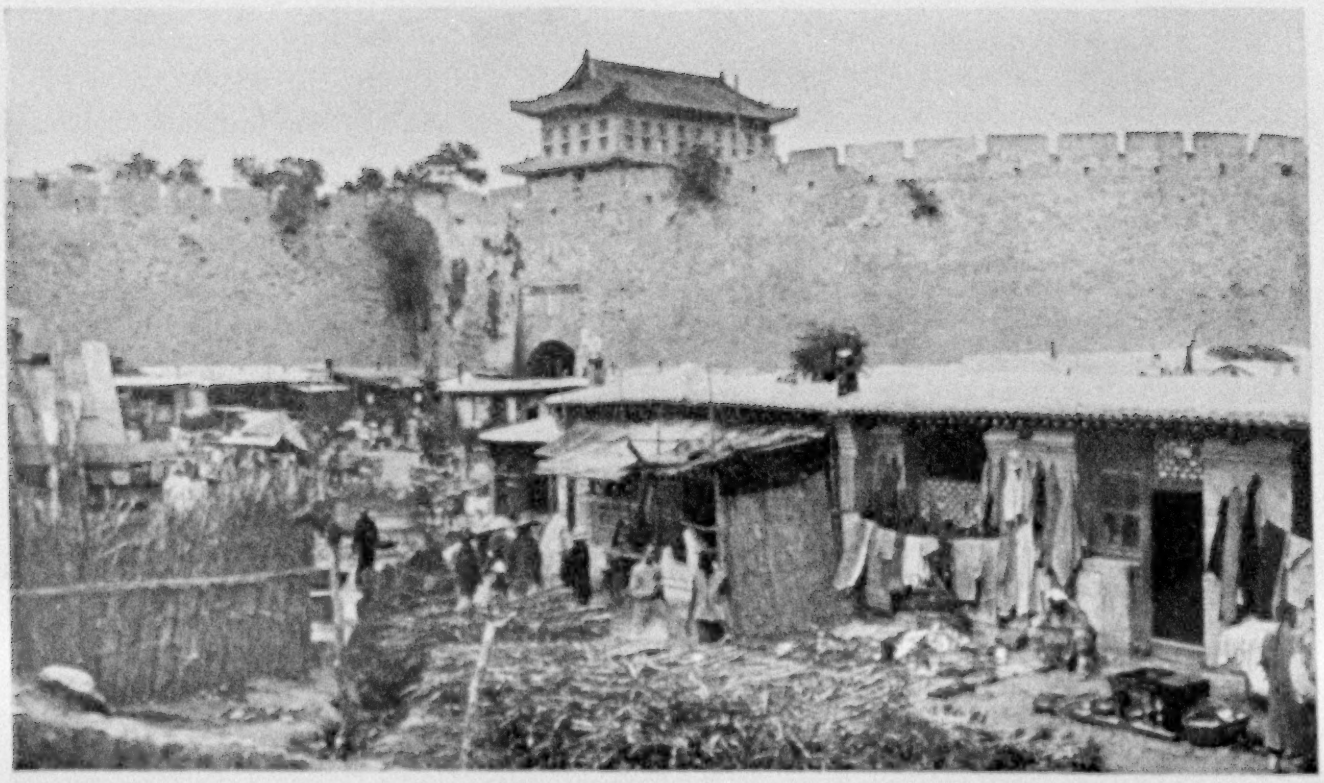
(Inside court; entrance to home. Group consists of Sin Song, wife, child, and wife's sister.)



ONE OF THE CITY GATES: SEOUL, KOREA
(Inside the city wall.)

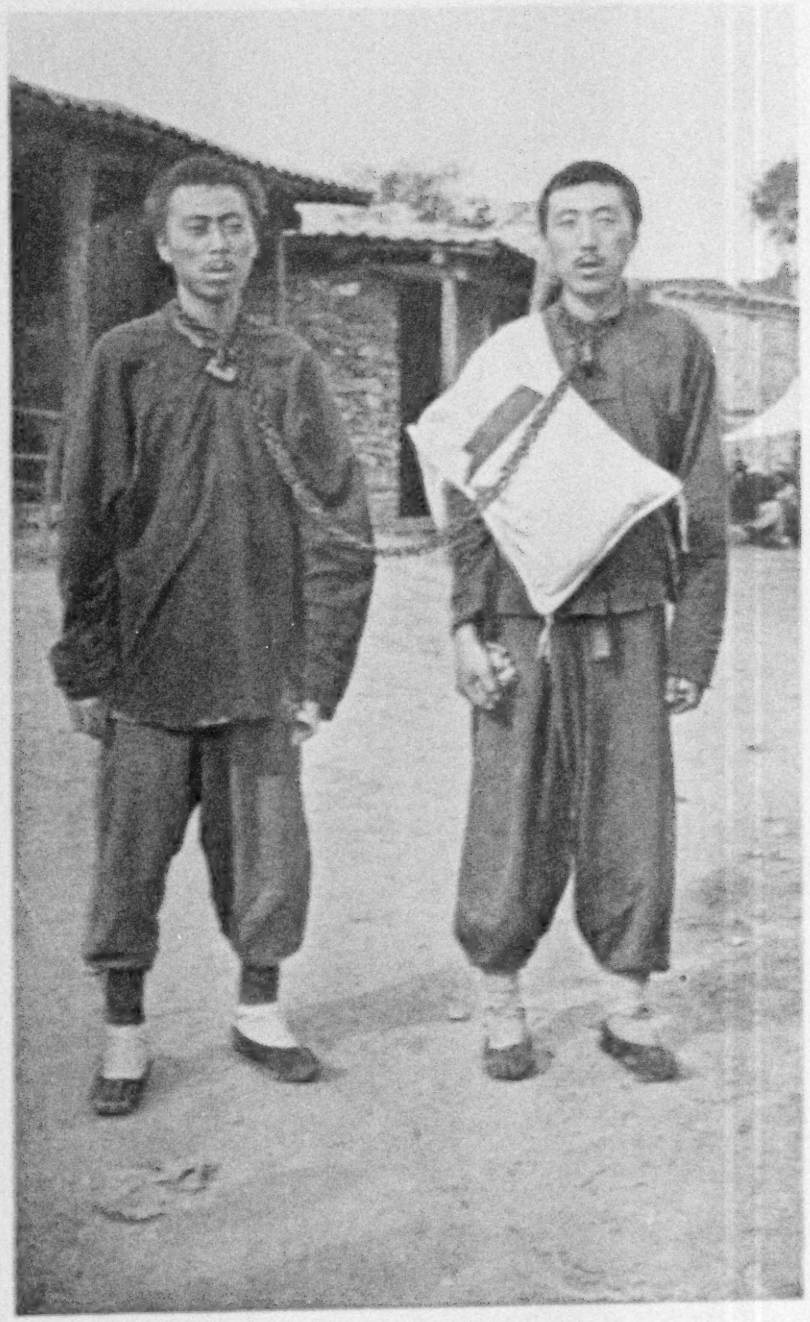


KOREAN GENTLEMAN: SEOUL, KOREA
(Bargaining for pottery.)

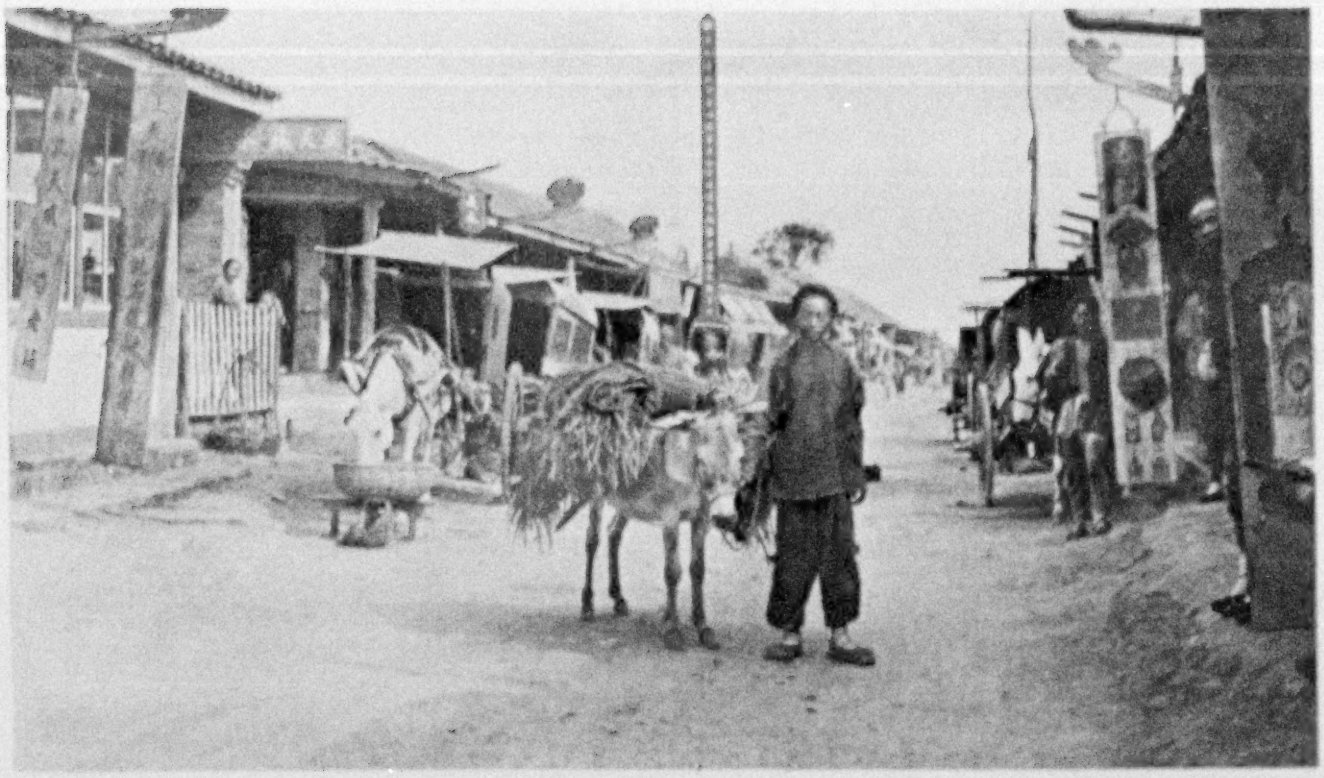


ONE OF THE GATES OF SHANHAIKWAN: CHINA
(A corner of the city inside the wall.)

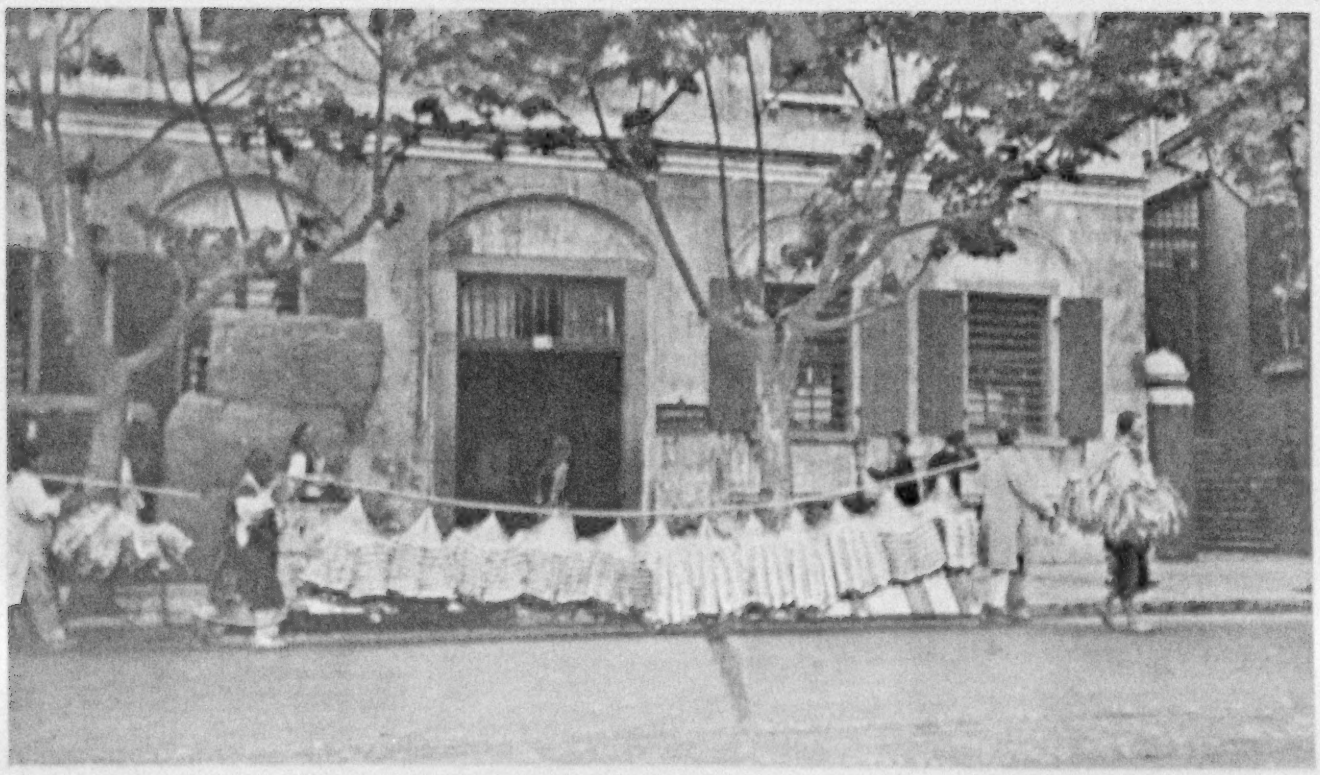
PRISONER WEARING CANGUE OR BOARD COLLAR:
SHANHAIKWAN, CHINA



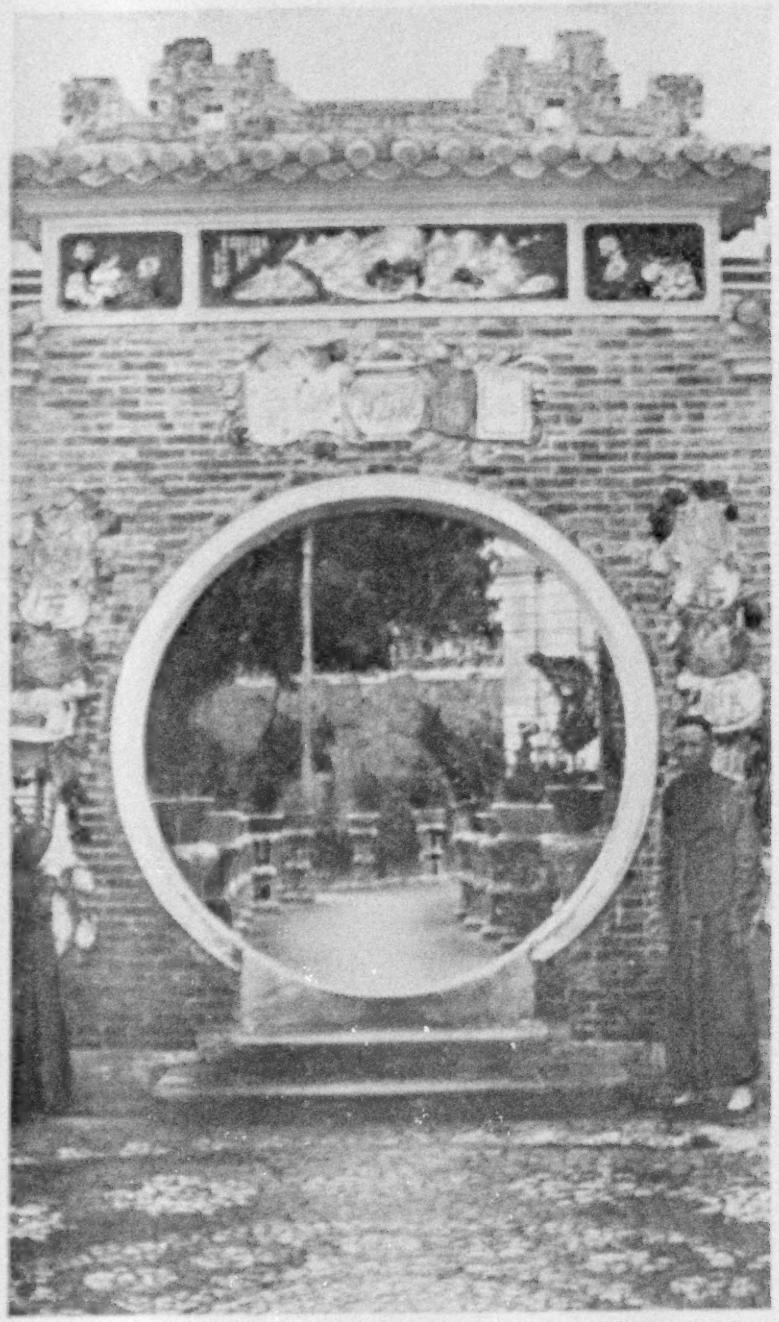
CHINESE PRISONERS
(Exhibited on the street before being liberated.)



A BACK STREET: PEKING, CHINA



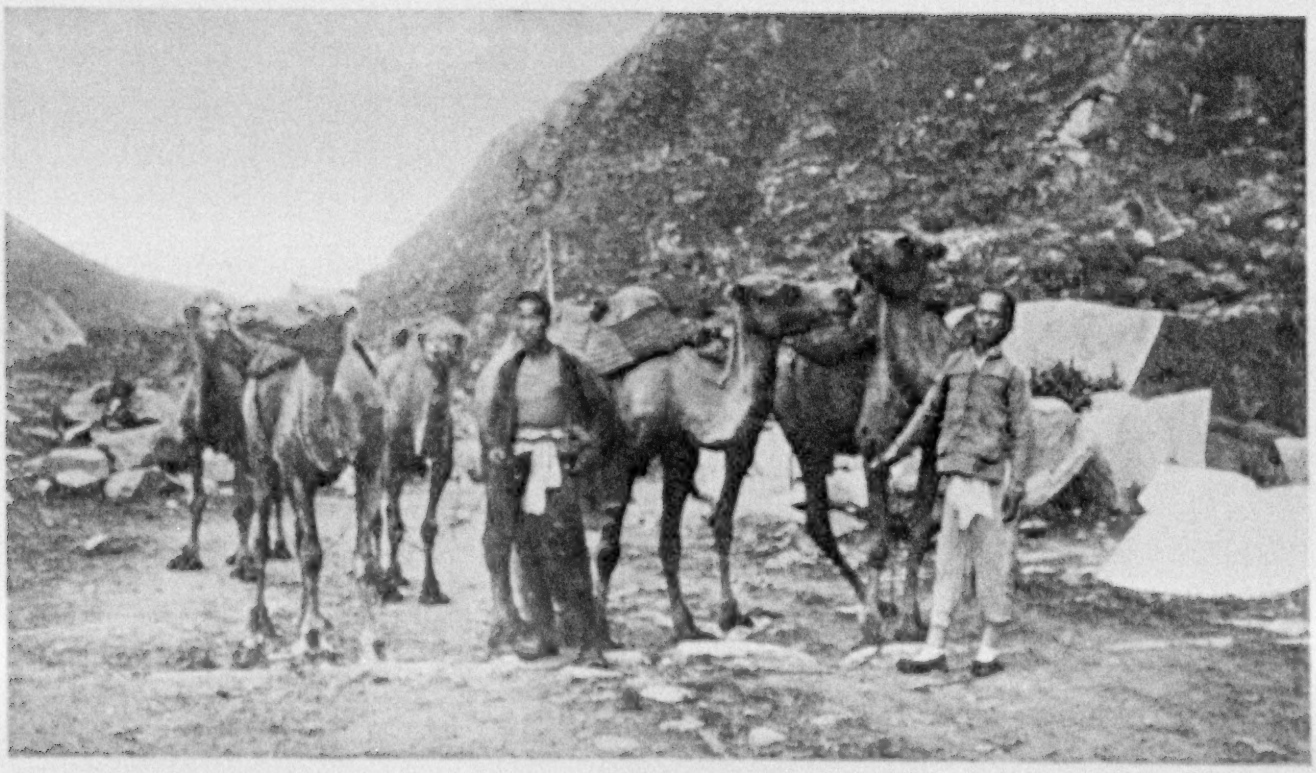
SYCHEE. PAPER SACRIFICE: CHINA
(Paper scrip for sacrifice in the temples.)



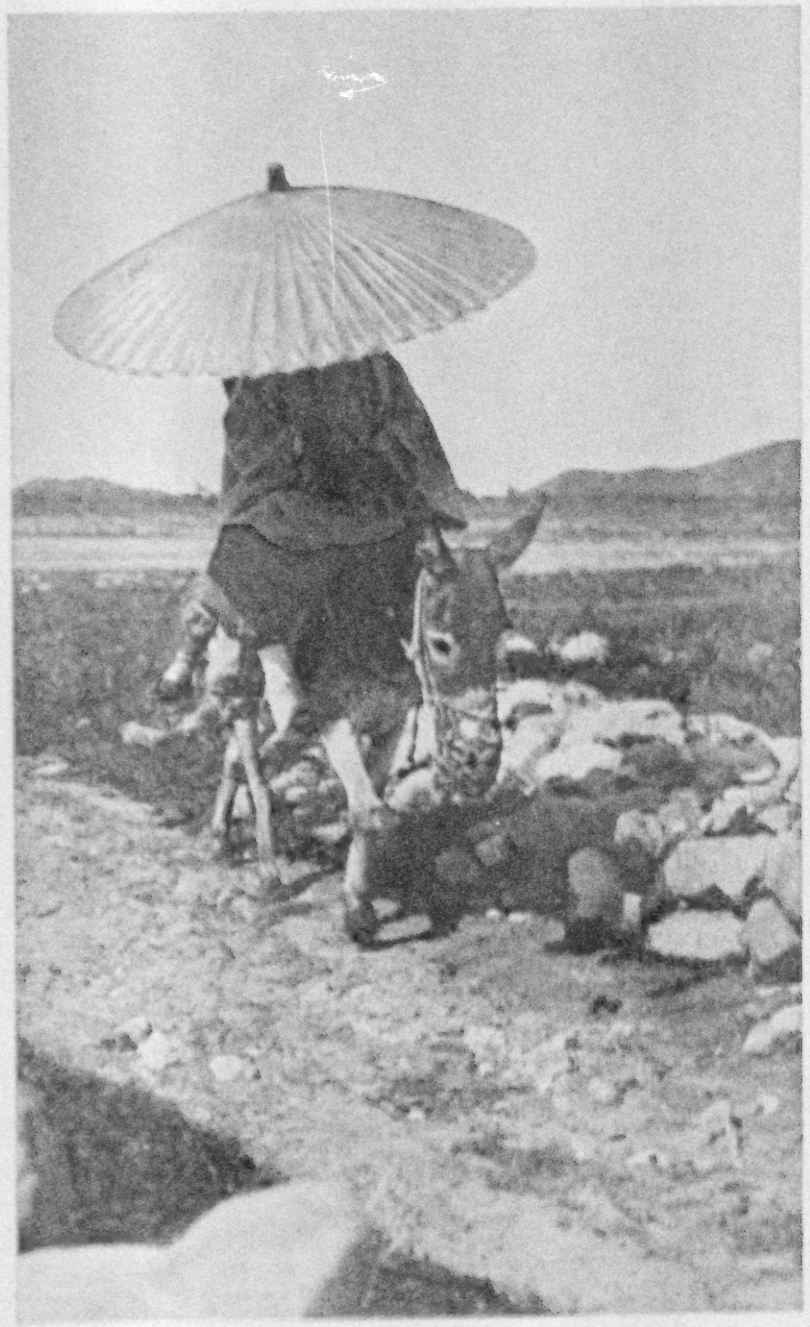
ENTRANCE TO CITY OF THE DEAD: CANTON, CHINA

MARBLE MANDARIN: CHINA
(One of the marble figures on road near Ming Tombs. Guide Chin on donkey.)

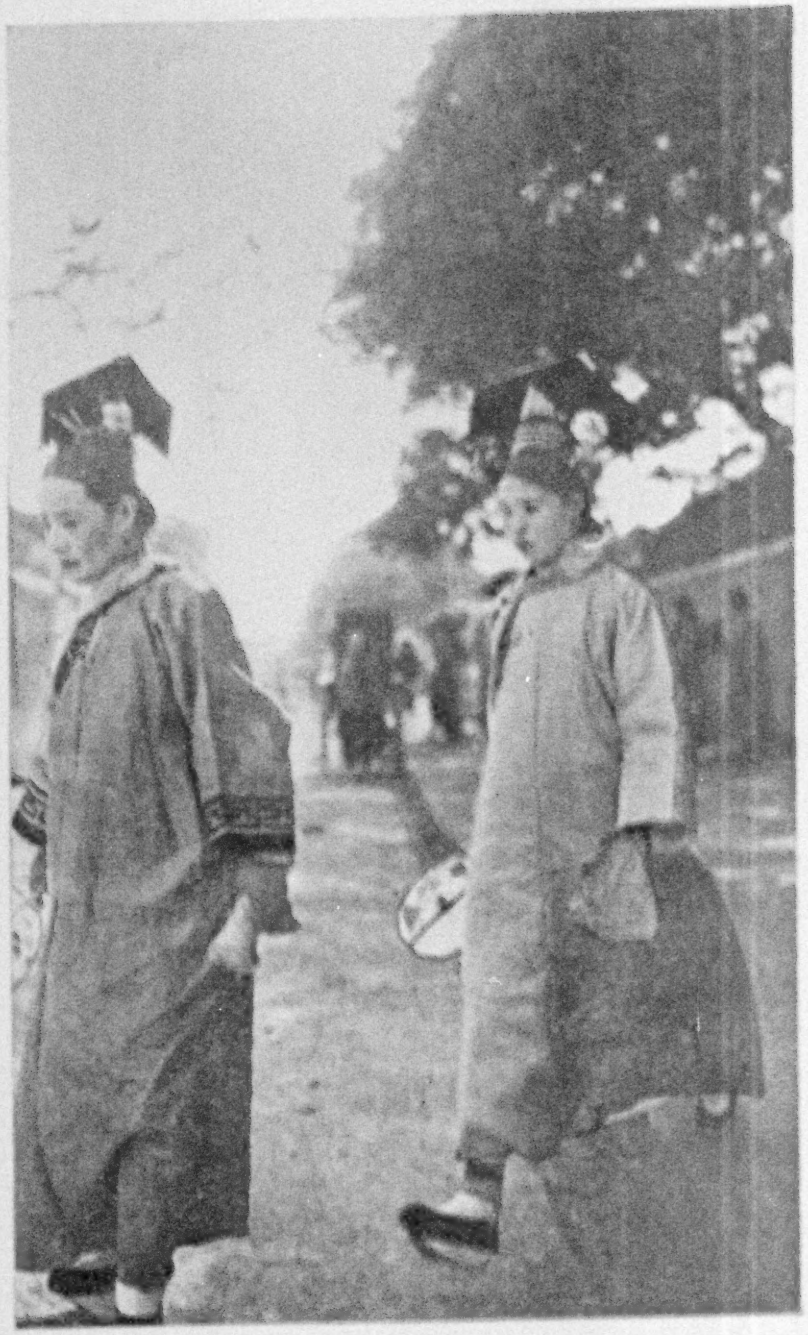
THE MANCHU FAMILY AIRING: PEKING, CHINA



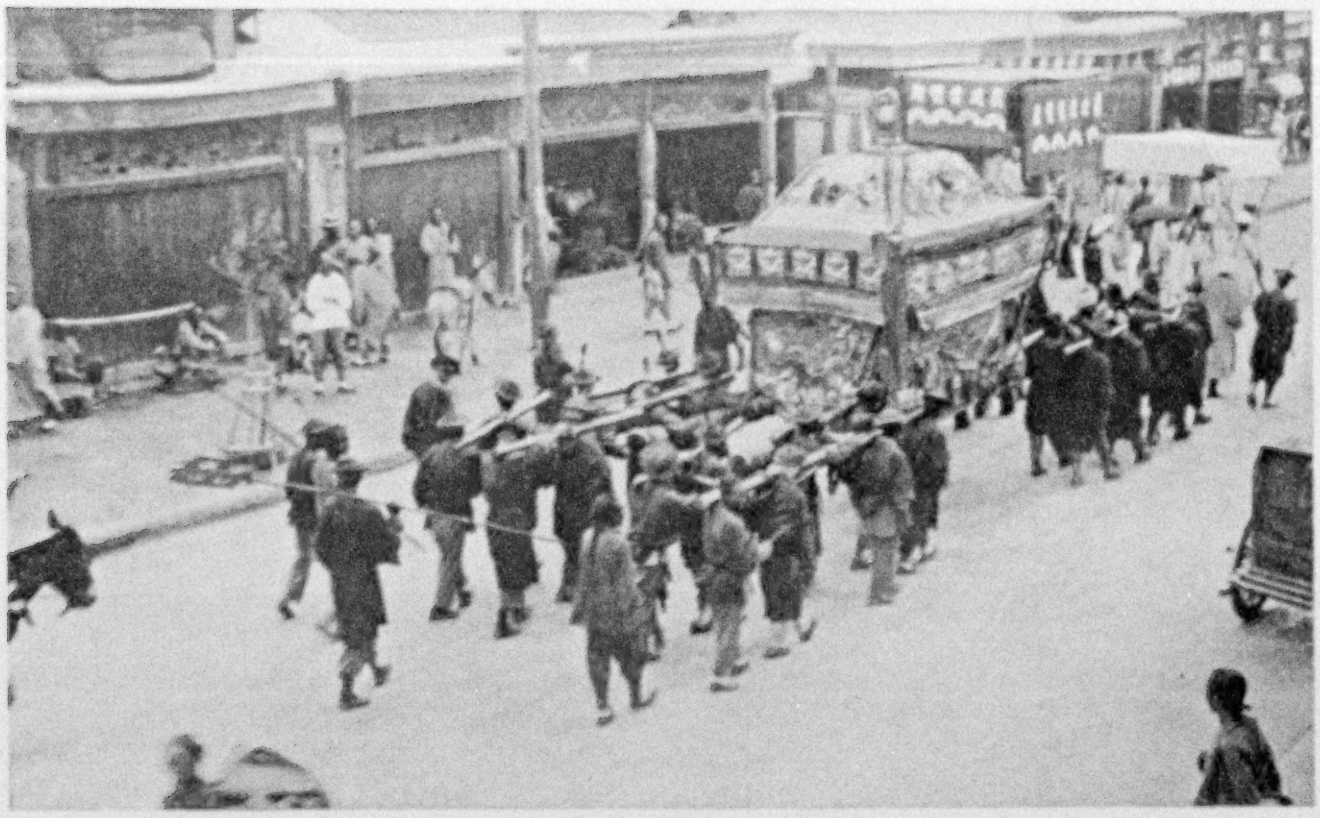
MONGOLIAN CARAVAN: NANKOU PASS, CHINA



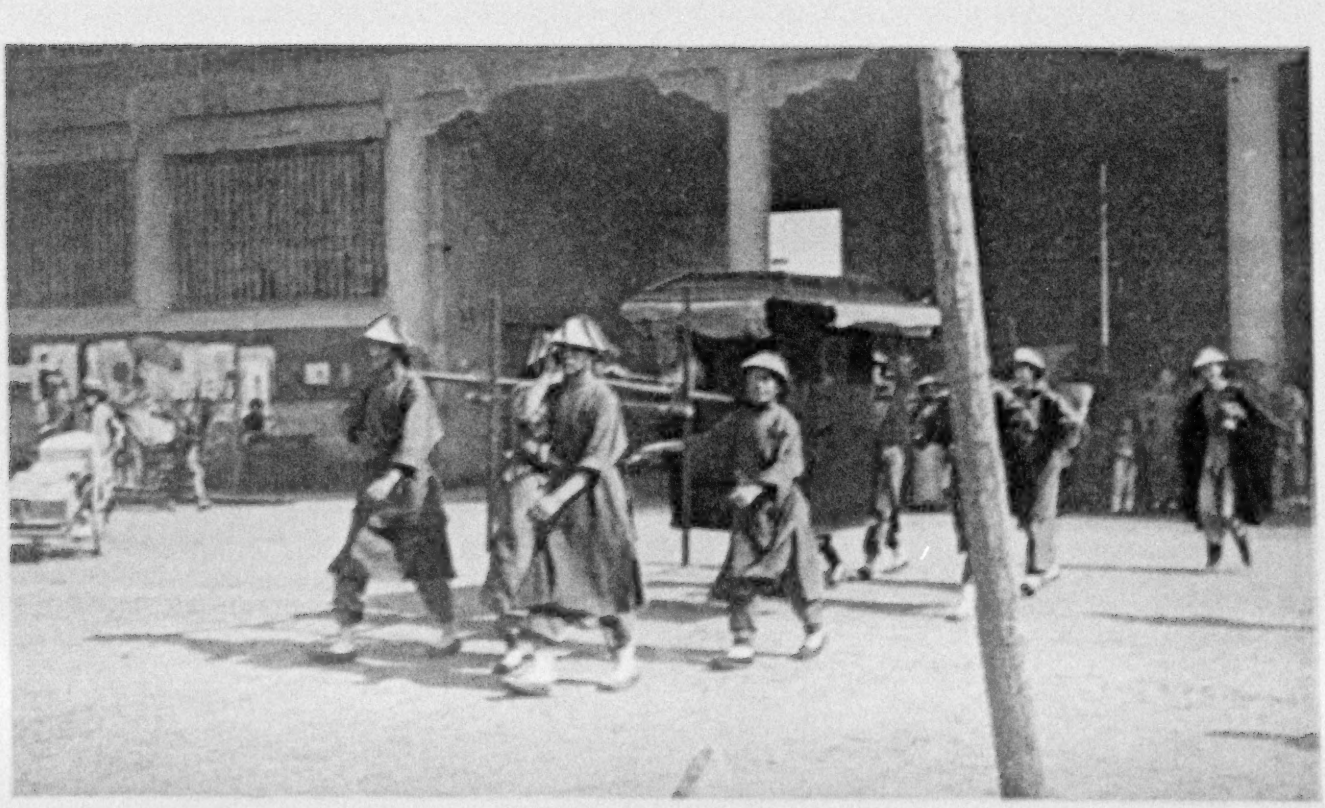
"PUZZLE PICTURE," NEAR MING TOMBS: CHINA
(How many passengers are being carried?)



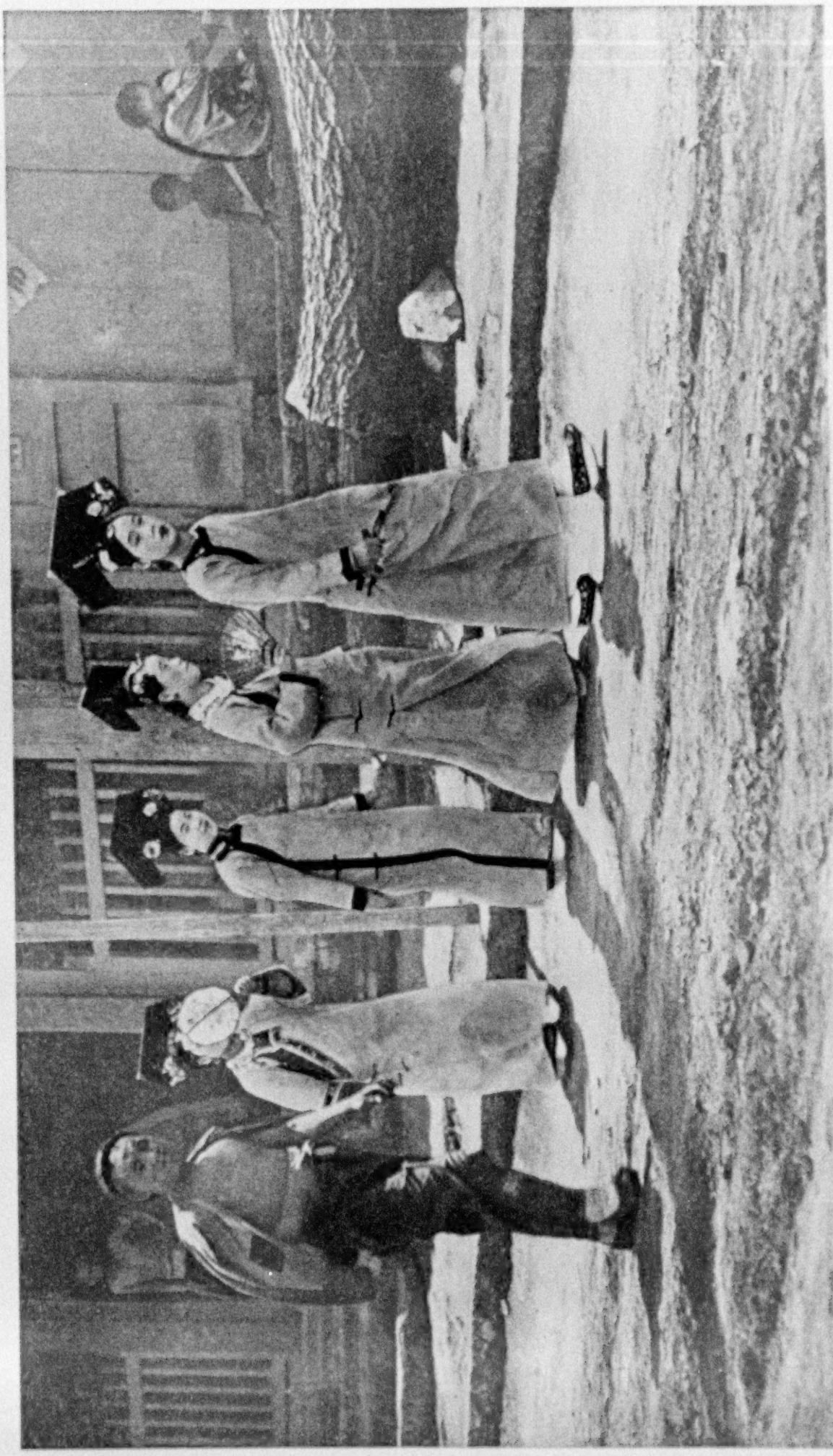
MANCHU WOMEN: PEKING, CHINA
(Crossing road to dodge the kodak.)



CHINESE HIGH-CLASS FUNERAL: PEKING



WEDDING CHAIR OF GROOM: PEKING, CHINA



MANCHU WOMEN: PEKING, CHINA

pounded the wet garments placed on smooth stones. On one of these occasions, in the same stream a short distance from this jolly crowd, were others rinsing and trimming cabbages and other vegetables, preparing them for market. On the same sewer, a little farther on, was a poultry market, with numbers of crates of fowls, close to the water. We wondered how clothes could be made so white under such conditions.

The religious uplift of Korea has been almost phenomenal. Based on the latest reports of the results of missionary efforts, comparatively speaking, it leads the world. If the Christian workers whom it was our good fortune to meet in this field are indicative of the devotion and aggressiveness of the others, and if they are aided in the future by the more liberal support of Christians, which the past success of the work warrants, it seems reasonable to expect the wonderful results begun will continue beyond all precedence.

At the service which we attended in the Methodist Episcopal Church the edifice was filled to the doors. On one side of the center aisle sat the men in white, all wearing the peculiar little hats; the opposite side was occupied by women with heads uncovered, many of them gowned in different shades of green, with red waists or jackets. The space in front and at each side of the preacher, extending about ten feet, was filled with children, sitting on the floor. During the prayers the women turned in their seats and knelt.

In this church the curtain, which for years hung in the center aisle to shield the women from the scrutiny of the men, had been removed at their suggestion two years before. The pastor, a native, distantly related to the royal family, is said to be a very talented and forceful preacher.

A visit to the imperial palace, although unoccupied, was interesting. The buildings and grounds are extensive; a handsome pagoda standing on a small island is surrounded by a lotus pond, a wealth of trees adding to the beauty of the place. During the reign of the old emperor, his fear of assassination was so great that it is said 300 bed-rooms in the palace were kept constantly in readiness for him, no one knowing which one he would occupy on any night.

One of the most enjoyable trips from Seoul is by rickshaw past the Peking or Independent Gate through a picturesque road winding among the mountains. The construction of the great wall of Korea at this point appears a marvel of engineering skill, so seemingly inaccessible is this mountain fastness. Proceeding about two miles, we pass the water-gate, where the wall crosses the river and where in time of attack the iron gates in these great arches were let down to protect the city. The view of this crossing is one of the finest in Korea.

Another ride of three miles brings us to the White Buddha. In the solitude of this wilderness, far from the highway, close beside a clear mountain stream, stands a great granite boulder, on the face of which, carved in relief, is the sitting figure of Buddha. Above is a curved roof of the pagoda style, with elaborately carved cornice decorated in high colors. Every three years the outlines of the idol are given a coat of white paint, with a delicate moustache, ears, etc., in red to give it character. In front of the idol was a little shrine on which stood a lantern.

Enterprising shop-keepers in Seoul evinced their desire for English trade by signs, some of which were full of detail: "Handkerchief special occupation," "Copper, iron, lead and repaired store," "Broker for several kinds of manure," "Wild silk," "Cow meat," "Firm and without fade at bedyed for many colors," are self-explanatory.

Over a drugstore was, "Every medicine is required for small or wholesale," followed by the assurance that "all kinds of sickness must be examined or cured," while hanging in the window of a vacant building was the announcement, "To sell apply within next door."

The raincoat used by the Korean peasant and farmer is in shape a long cloak

BLIND STREET MUSICIANS; PEKING, CHINA

fastened around the neck, and is made of long straw, one layer overhanging another similar to a thatched roof, and is only effective when the wearer stands erect under the broad-brimmed hat.

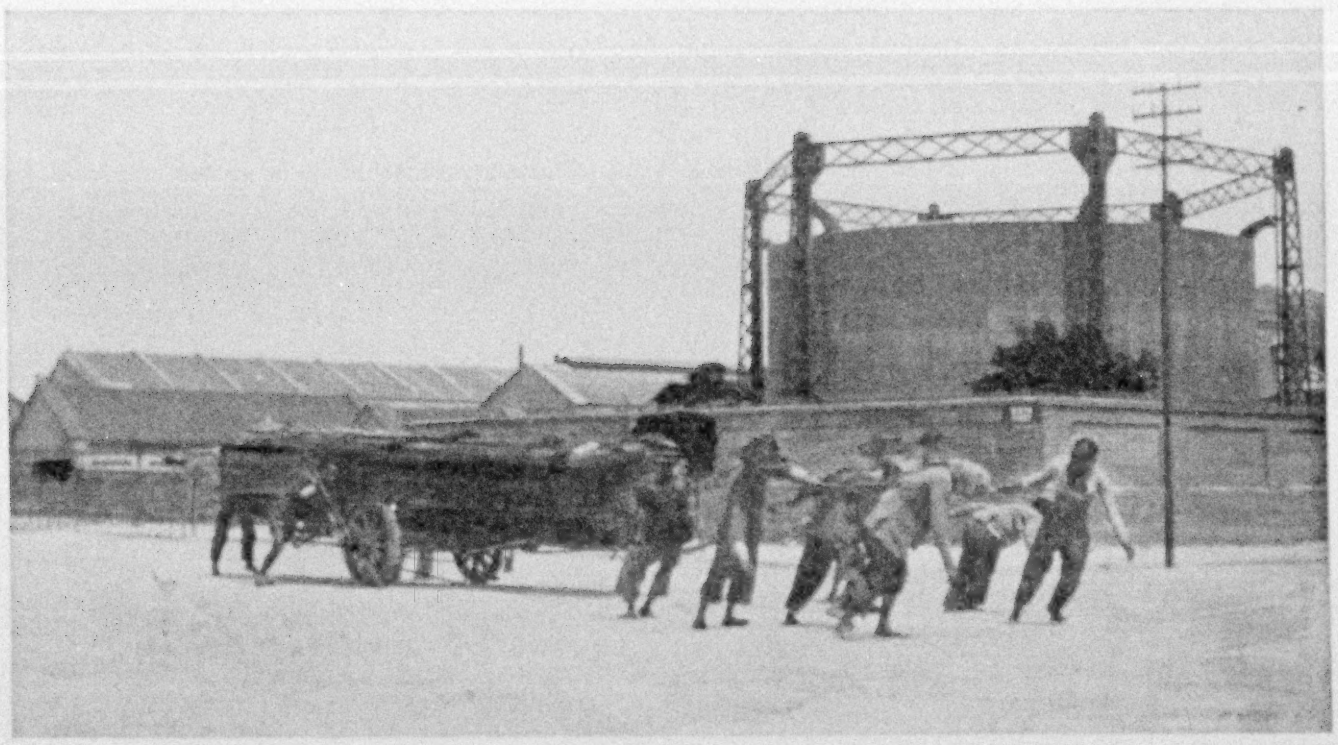
The poultry peddler is a familiar object on the streets of this city, bearing his load of cackling merchandise in a cage on his back—a method of vending, to our minds, far more reassuring to the purchaser than holds among the Chinese, where dressed fowls are offered for sale, prepared by some process giving them the appearance of having fainted, so sickly white do they look.

The assassination of the beloved Queen of Korea by a Japanese in 1895 was an act which stirred this old sleepy nation to its foundation. Although her body was burned to conceal the crime, a small bone was recovered, for which a suitable place of interment had to be found. After the selection of several locations, upon one of which considerable labor was expended, all were abandoned for astrological objections. The astrologers, however, favored another spot, and, although this happened to be already occupied by a village, at great expense 1,000 acres were cleared of habitations, trees planted, an artificial hill 50 feet in height raised, and the small portion of her remains here buried in state. This assassination was one of the causes incident to the intense feeling of resentment which the Japanese met in their efforts to subjugate Korea.

How rapidly have events vital to Korea succeeded each other since the death of her Queen, in 1895—the Chinese-Japanese and Russo-Japanese wars, followed by the assassination of Marquis Ito and other Japanese officials by Koreans, all tending toward the final extinction of this little nation as such. It is still a matter of considerable doubt as to the extent of benefit the change will prove. So far as revealed, Japan's intentions seem satisfactory to the powers and ultimately to the advantage of the people of the Mikado's new province, Cho-Sen.

## CHINA

If a very high estimation be placed on Korea in point of unusual pictorial subjects, China's vast area of 43 times that of its little neighbor ranks still higher in the variety of its scenery, being a veritable paradise for kodakers. Although in certain localities there is some personal objection to being included in pictures, owing to superstition as to the



HAULING AN IMMENSE LOG

power of the evil eye with which the lens of the instrument is associated, it is but trivial.

Probably no part of the Dragon Empire can furnish such a stream of entertaining subjects as the great city of Peking, for on its site there has been a city 3,000 years, and it has been the seat of government since 1282. The present population is estimated at 1,500,000, and, although its massive wall 50 feet high describes a circumference of but 25 miles, the thickly populated suburbs close to the enclosure are fully as attractive.

Of all subjects we attempted to openly kodak in the city of Peking, the dainty, shy Manchu women were the most difficult. Naturally retiring, they seemed instinctively conscious of the presence of the camera, as a crow is said to smell the powder of the hunter, and so exhibited their timidity by running like a rabbit, dodging into doorways, where they would stay until the danger was passed. One would scarcely think they would object to a foreigner conveying their picture to their sisters on the opposite side of the globe, since they had spent so much time in arranging their hair on the peculiar-shaped thin boards, liberally applying cosmetic and vermilion on their faces and arraying themselves in their handsome gowns.

The mode of travel to the interior of China is on the back of a donkey or in the springless mandarin or Pekingese cart drawn by the same animal. During the trip to the Ming Tombs the snapshot was made which resulted in taking what proves to be a puzzle picture (see page 924). The umbrella was held low to prevent our taking the faces of the passengers, for if examined carefully a second person may be seen holding the umbrella.

One of the cheaper conveyances in Peking is the open Pekingese cart. It has a canvas covering extending from over the donkey's head to the back end of the vehicle. The most elaborate feature of the outfit is the fellies of the wheels, which are embellished with three rows of ornamental headed nails, giving the appearance of great strength. Although the jolting propensity makes these wagons most uncomfortable, nevertheless they are very popular and are frequently so filled with people that there is standing room only.

Peking is the Mecca toward which weary, burdened caravans wend their

XUM

A STEAM ROLLER IN THE AMERICAN SETTLEMENT AT SHANGHAI

way from distant boundaries of Mongolia, scores of them daily exchanging their valuable cargoes of the products of those lands for teas and other supplies.

The tired, dust-begrimed beasts in these trains seen entering the great city gates are not the gaily caparisoned, well-fed camels of the circus street-parade common to America. Owing to the exhausting heat of the sun, many of these caravans travel by night, the animals being relieved of their burdens in the morning for a few hours' rest, until the line of march is resumed at nightfall.

The occupation of mendicant street musician appears to be monopolized by the blind. From the sounds they produced on their strange, discordant instruments, we thought it would be much to their own advantage to be deaf also. The poor creatures were very numerous; while occasionally seen singly, they were more frequently met in twos or threes.

The method of street sprinkling in Peking is quite novel. A tub containing about one-half a barrel of water is carried by means of a pole run through the handle on either side. Two men carry this from the street-pump to the part of the road to be sprinkled. The pole is removed and one of the men, with the aid of a long-handled dipper, throws the water broadcast. This is an instance where "Chinese cheap labor" works in very advantageously.

Nothing in China will bear comparison, however, with what is known as the Great Wall. The very ancient city and provincial walls were connected more than 2,100 years ago. As an example of engineering skill, where is its equal? Its course, beginning in the sea, reaches an altitude of 10,000 feet, skirting the highest mountains and crossing the most inaccessible gorges. Considering it as a war measure, it is the most gigantic defensive work in the world. In extent it covers a length, according to recent investigations, of 2,550 miles. These facts alone would establish its claim to being classed near the top of the list of world wonders, without mentioning the wall as being the longest cemetery on earth, owing to the great mortality attending its construction, when the practice prevailed of burying the dead in the filled space between its outside retaining walls. Then we must not lose sight of the

STREET SPRINKLING: PEKING, CHINA (SEE PAGE 930)

claim some scientists have made that this serpent-like structure is the only object on the earth's surface which can be distinguished by our distant neighbors on the planet Mars.

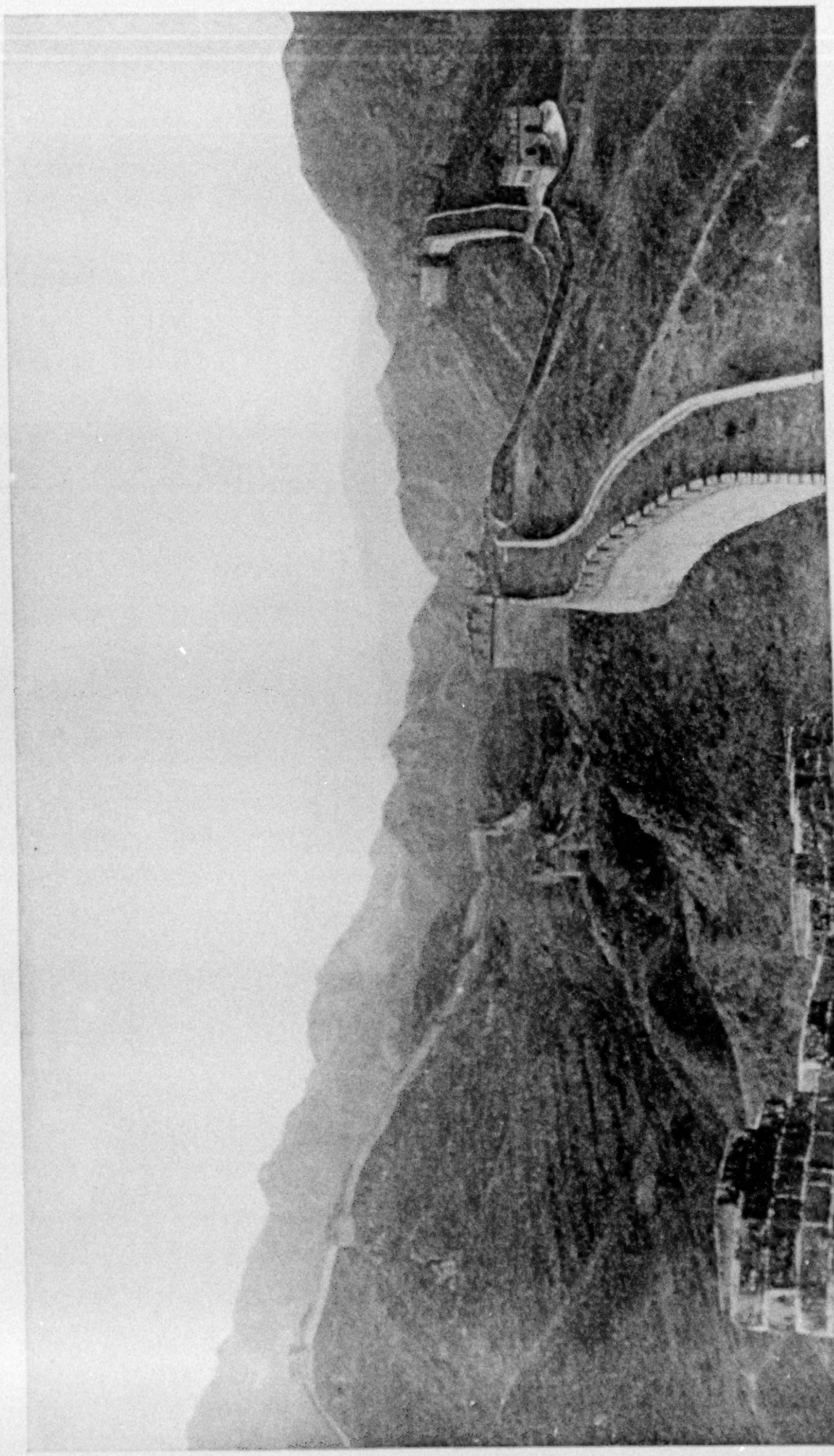
Mr. Toole's account of the Great Wall, while humorous, contains some historical facts. He says: "The most important building in China is the Great Wall, built to keep the Tartars out. It was built at such enormous expense that the Chinese never got over it, but the Tartars did. The way they accomplished the feat was 'One went first and t'others went arter.'"

Wedding processions, always interesting in every land, are quite spectacular in China, and, like funeral pageants, are preceded by music, if the sounds produced by the pipers can be so termed. In the street procession the groom appears to have no part, his chair, borne by eight coolies, forming an independent parade.

The variety and splendor of funeral processions is one of the features of Peking. There is a Chinese proverb which reads, "The most important thing in life is to be buried well." If this implies being placed well underground, the conditions are not generally carried out, for in no country, according to our observation, were so many half-buried coffins seen as here; but if the reference is to pomp and extravagance, could the deceased have seen the displays it was our privilege to view they would have crawled back to their caskets to resume their long sleep with the consciousness that the purpose of their lives had been most satisfactorily achieved.

The city of the dead in Canton, South China, has storage capacity for 500 caskets. This silent city is made up of a great number of small one-story stone buildings, each house having two rooms of about 8 by 16 feet in size. A cumbrous coffin with the name of the deceased inscribed in Chinese characters on the foot occupies each room. The only other object in the room is a small shrine near the entrance, upon which light refreshments are placed. Here, amid the fragrance of smouldering incense, the spirit of the departed may daily enjoy a quiet cup of tea and a small cake, provided that surviving relatives continue to pay the expense.

THE GREAT WALL OF CHINA, WHICH DEFENDED THE NORTHERN FRONTIER OF CHINA FOR A DISTANCE ALMOST AS FAR AS FROM NEW YORK TO SAN FRANCISCO



THE GREAT WALL OF CHINA: UP ON THE MOUNTAINS

Some of the caskets in these receptacles were elegantly finished in highly polished lacquer and cost $1,000 each. The object of leaving the remains in this place is to insure the happiness of the one of the three spirits of the deceased supposed to remain in the bones by providing for it food, drink, and shelter.

One of the peculiar beliefs regarding the dead is that, if the soul of the deceased does not rest comfortably, the relatives will be correspondingly unhappy. The expense of storage and attendance often becomes very burdensome. We were told of an instance where the cost for the storage of the remains of a woman had used up the entire property of her husband, and that then the former servants of the family had voluntarily come forward and were then defraying the entire expense.

One of the minor penalties inflicted on a person convicted of crime is to lock the cangue, or board collar, on his neck, which he is sometimes compelled to wear several months. This implement of torture is constructed of boards 3 inches in thickness and 3 feet square, weighing from 30 to 100 pounds. In certain cases the culprit is chained on the street, and, with his offense written upon the cangue, is exposed daily to the view of passers-by. The victim is dependent on his friends, owing to the width of the collar, which prevents him from feeding himself.

While in the city of Shanhaikwan, and wishing to obtain a picture of one of these unfortunates, a prison was visited in company with an interpreter. The amount the jailer required for producing a prisoner wearing the collar seemed a little excessive. But when, according to the habit acquired in the shops of the country, an offer of one-half the price asked was made, the subject was at once forthcoming. The background of the picture includes the rack holding the staves for use in administering the punishment decreed by the magistrate, or for forcing a confession from an accused prisoner.

In some parts of China it is the custom to exhibit through the streets prisoners who have paid the penalty of their crimes and are about to be released. This permits the people to become familiar with their faces, so as to recognize them thereafter. In the case of serious offenses, one of the first acts of punishment administered to convicts is cutting off the queue, considered a mark of deep disgrace.

So unique are the methods of this old empire in the administration of justice that the entire subject is one of deep interest; for where the world over is such a vast population kept in orderly control by the minimum police and military force?

A tourist, when visiting Northern China, does not feel he has lived up to his opportunities if he neglects to visit the "Ming Tombs." The Ming rulers were the last strictly Chinese dynasty, which terminated about 500 years ago, when overthrown by the Manchus.

The burial place of these monarchs is located about 50 miles from Peking and 7 miles from Nankou. The only means of transportation from the latter place to the site is on the backs of the frisky donkeys or in sedan chairs.

The monotony of the several miles' ride by this slow manner of locomotion through the plains begins to tell on one when, as if to dispute the way, there loom up ahead an avenue of ghostly figures. On approaching, these are seen to be great stones which have taken on the forms of mammoth mandarins, lions, elephants, camels, unicorns, etc., to the number of 48, and stand on either side of the path about 300 feet apart. The effect of meeting these silent figures, which seem to gaze on one as he proceeds through the solitude of the lonely place, is quite impressive.

The accounts that travelers and writers give of conditions and experiences within this vast empire sometimes seem very conflicting. However, customs are so radically different in the several provinces that only a short visit is necessary to convince one of the probable truthfulness of the statements, as well as the fact that the half has not yet been told of this people, so wonderful, so ancient, and so unique.

XUM

# A NEW SOURCE OF POWER

## Billions of Tons of Lignite, Previously Thought Too Poor Coal for Commercial Use, Are Made Easily Available

By Guy Elliott Mitchell

Author of "Our Greatest Plant Food," "Our Coal Lands," Etc.

LIGNITE is a low grade of coal—the lowest and poorest in heat units, and only a step removed from peat and wood. The government coal geologists estimate that the deposits of this fuel in the United States exclusive of Alaska aggregate about 740 billion tons (740,000,000,000), of which fully one-third belongs to the public lands.

A few years ago it was not considered important whether there was much or little of this coal. It was good enough, perhaps, for the farmers to dig out a few loads and burn in their homes throughout the Great Plains region, where it is found; but it contained too few heat-units and too much moisture to generate steam under a boiler, so it was looked upon as of no industrial importance whatever.

Moreover, it would not bear transportation well, since it air-slacked and crumbled. A large part of the waving wheat-fields of North Dakota were known to be underlain with lignite, but it was too young geologically, too poor in fixed carbon, to be of any great material use to the State or the Nation. Subjected to volcanic or other great earth pressures, or aged a couple of million years, it might become a second Pocahontas coal and attain great value commercially.

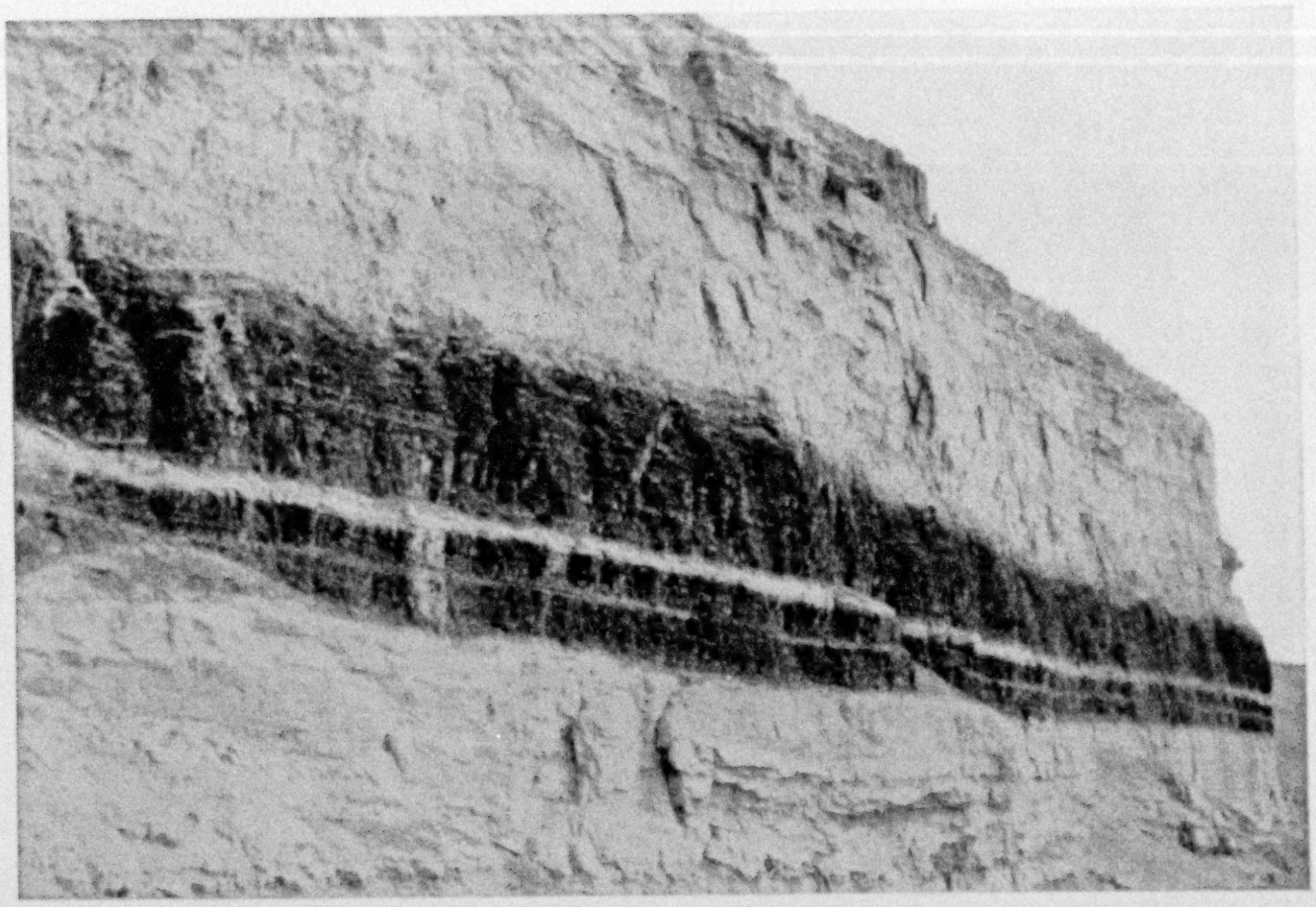
But the value of a thing is often a mere matter of knowledge concerning it. The Saint Louis World's Fair came along, an exposition of the products of the great territory acquired from Napoleon, and it was fitting that as a result the lignites of the Dakotas and Montana, parts of that wise purchase, should be demonstrated to have an incalculable potential value.

### BY WHICH LIGNITE RIVALS OUR BEST COALS

The present director of the new Bureau of Mines, Dr Joseph A. Holmes, suggested the establishment of a government fuel-testing plant at the Saint Louis Exposition, under the Geological Survey, and one of the most important and far-reaching discoveries of the tests was that lignite, the useless, the despised, would do more actual work, turn more wheels of industry, ton for ton, if burned in a gas producer, than the highest grade, highest priced Pennsylvania or West Virginia coal fed into the best steam engine in existence.

The results of these tests are among the most remarkable of an age replete in wonders of discovery and invention. North Dakotans need not wait two million years nor pray for a volcanic convulsion to transform their lignite into coal; the lignite today has an industrial value which may yet turn many billowy grain fields into thriving manufacturing centers.

Plainly stated, these Geological Survey fuel tests showed that when coal is made into producer-gas and then used in a gas engine it has from two to three times the efficiency or driving power that it has when burned under a steam boiler in the ordinary way. The high-grade coals, too, were found to possess a greater efficiency when used in a gas engine, but the spectacular feature of the experiments was that vast stores of



AN 8-FOOT LIGNITE SEAM, NEAR GLENDIVE, MONTANA

lignite, which are entirely useless for steaming purposes and had previously been considered practically worthless, can be used most successfully in the gas producer.

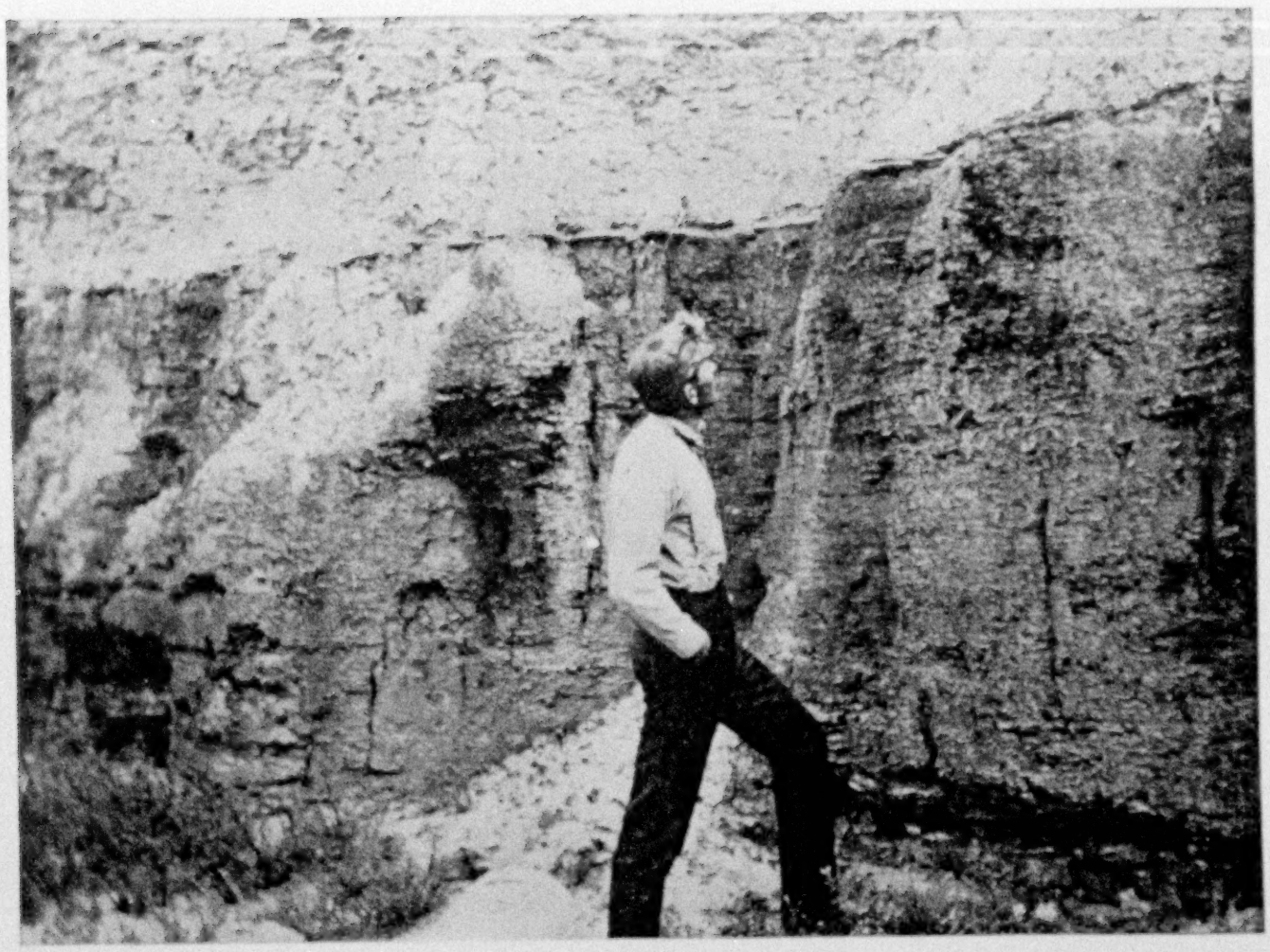
REMARKABLE WORK OF THE GAS ENGINE

Prof. Robert H. Fernald, late in charge of the producer-gas tests of the Geological Survey, made an estimate of the cost and operation of a small gas engine in comparison with that of a steam engine of the same horse-power, and also of two large engines, gas and steam, of the same horse-power. The figures are impressive. Professor Fernald gives the cost of a 600-horse-power gas plant at $48,000 and the steam plant at $40,000—$8,000 in favor of the steam plant. Operating both plants 300 days, 24 hours a day, the total cost for coal in the gas plant would be $3,680; in the steam plant, $8,250.

In a large plant, however, of 6,000 horse-power, he found no difference in cost between steam and gas plants. But, running these two plants continuously for one year, the gas plant would require but 21,000 tons of coal, which, at say $2.50 a ton, would be $52,500, while the steam plant would consume 42,000 tons of coal, at a cost of $105,000. The total operating expense and fixed charges of the 6,000-horse-power gas-producer plant are given at $141,775, while those of the 6,000-horse-power steam plant would cost $219,535—an annual saving of $77,580.

In offering the estimates, Professor Fernald declares that he has made the best possible showing for the steam engine, while that of the producer-gas plant is but a fair figure. In conclusion, he adds: "I believe that the producer-gas plant can better the figure given, but I doubt very much whether the steam-plant figure can be excelled, even if it can be reached."

Surely such savings of cost as these must appeal to the big manufacturers. That they do is shown by the fact that certain types of steam engines exhibited



A 9-FOOT LIGNITE SEAM, NEAR WILLISTON, NORTH DAKOTA

at the Saint Louis Fair as the very acme of steam-engine construction have since then been thrown onto the junk-heap and gas-producer plants substituted.

### PRODUCER-GAS *vs.* STEAM PLANTS

In one of Professor Fernald's reports* a large number of most interesting comparisons are given, showing the relative efficiency of steam and gas plants in converting various grades of coal into electrical energy. Thus, of an Illinois coal from Springfield, it required 5.27 pounds to develop 1 horse-power in the steam plant as against only 1.79 pounds in the gas plant. Of an Indiana (Terre Haute) coal, it required 4.52 pounds in the steam plant against 1.61 pounds in the gas plant to develop 1 horse-power.

Most notable, however, were the results in the low-grade coals and lignites. Of a North Dakota lignite from Lehigh, 10 pounds were required in the steam plant to develop 1 horse-power, and only 2.82 pounds in the gas plant. With other lignites from Williston, North Dakota, Red Lodge, Montana, as well as several Texas lignites which proved absolutely worthless under the steam boiler, from 2½ to 3½ pounds developed 1 horse-power in the gas producer. Of 75 comparative tests made by the Geological Survey, the coals, when used in the gas plant, had from 2½ to 3½ times the driving power that they had in the steam plant.

In these tests the North Dakota and Texas lignites, and even Florida peat, yielded more power than did the very best Pennsylvania and West Virginia coals under the steam boiler.

### HIGH VALUE OF THE LIGNITES

Commenting on the value of these tests, with special reference to the Dakota and Texas lignites, Professor Fernald remarks:

* Bulletin 416, United States Geological Survey, can be had upon application.

SEVEN FEET OF SOLID LIGNITE IN THE YELLOWSTONE RIVER BLUFFS, NEAR SIDNEY, MONTANA

"It should be noted that many fuels which give poor results under steam boilers have been used with great ease and efficiency in the gas producer, which thus makes it possible to utilize low-grade coals and lignites that have heretofore been regarded as practically useless. Several of the poorest grades of bituminous coals have shown remarkable efficiency in the gas producer, and lignites and peat have been used in it with great facility, thus opening the way to the introduction of cheap power in large districts that have thus far been commercially unimportant, owing to lack of industrial opportunities."

Although the gas producer is quite a new institution, the possibilities of this form of power and its ultimate future is indicated by the fact that there are already in the United States between 150 and 200 gas-producer installations, ranging in size from 1,500 to 9,000 horse-power.

The latest and perhaps most interesting phase of the development is the conversion into producer gas of the waste from blast furnaces. At the Gary steel plant, in Indiana, where the great blast furnaces run night and day, the fumes and waste which would otherwise belch from the huge chimneys to pollute the atmosphere are captured and converted into producer gas to the extent of creating 100,000 horse-power. This suggests the fact that with the producer-gas plant there is no smoke nuisance. The poorest, smokiest, smudgiest coal may be used, but there will be no smoke, because there are no smokestacks. The gas is generated in a producer which has no chimney and needs none. The coal is turned directly into gas, which goes straight to the engine.

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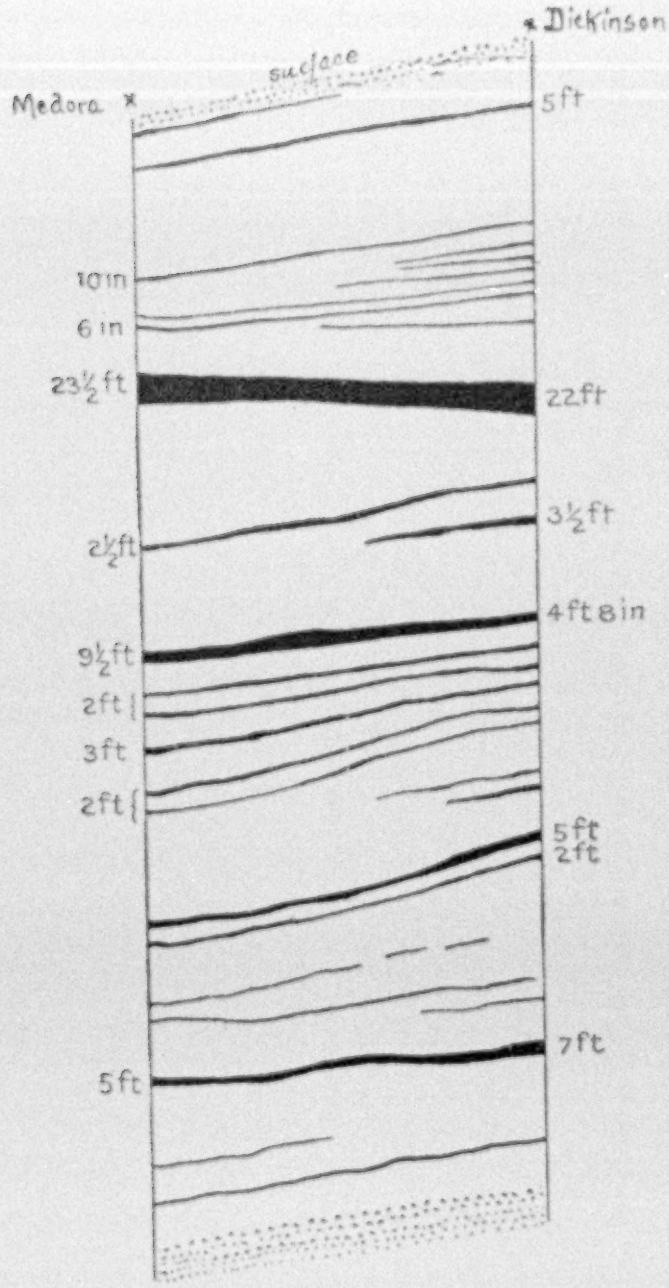
THE PASSING OF THE STEAM ENGINE

Really it seems as though we had come to the passing of the steam engine, the maker of civilization, and that the gas engine, the toy of yesterday, has loomed upon the industrial horizon and grown over-night into the giant of today. Its appearance means not only an eventual saving in the country's coal bill variously estimated at from $100,000,000 to $200,000,000 annually, but certainly a wider distribution of industrial enterprises.

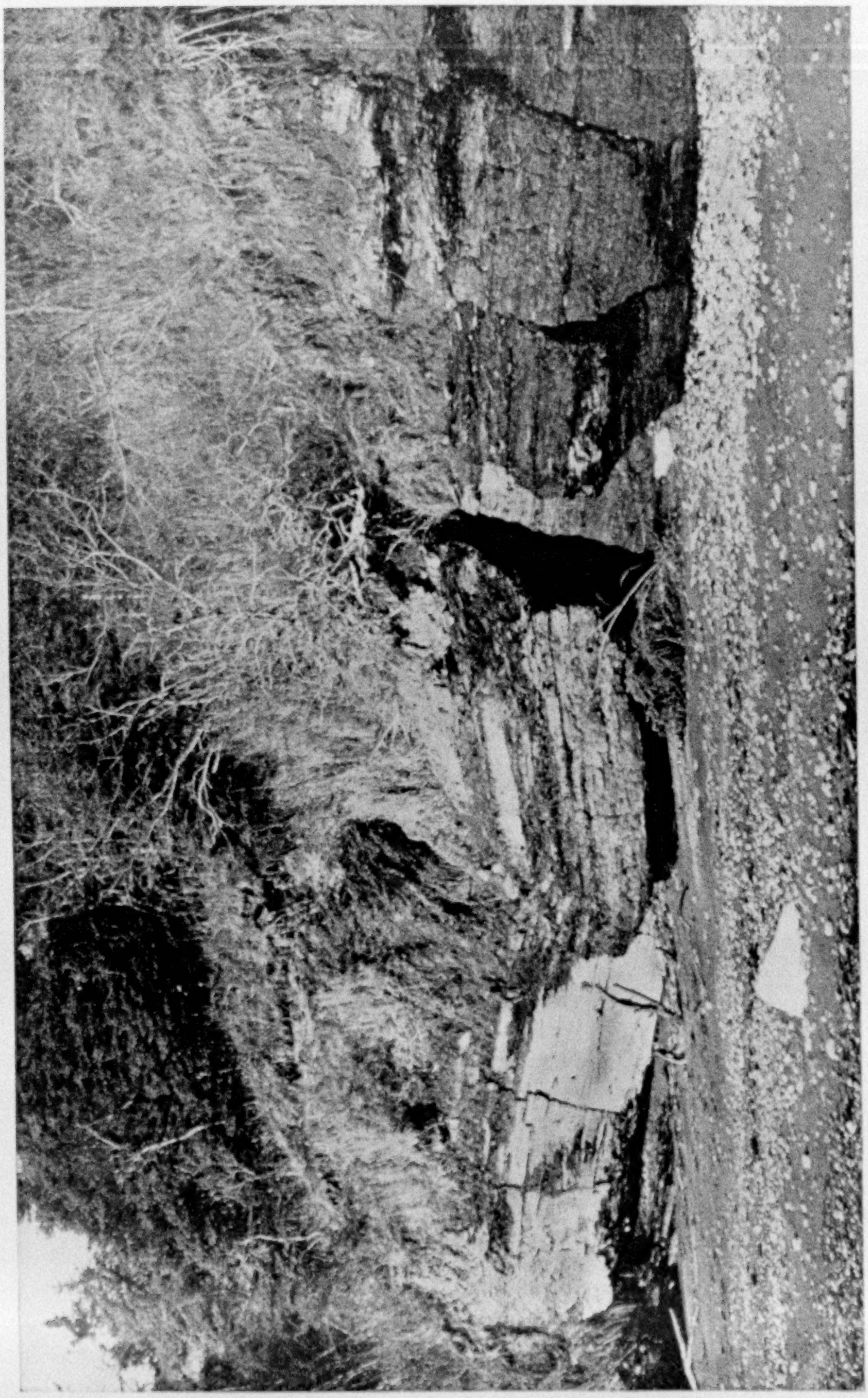
The great reduction in the cost of power production, made possible by the use of the gas producer, Professor Fernald says, means also rapid strides in electrical development within the next few years. Now that it is commercially possible to transmit electrical power for distances of 250 miles or more, the location of immense power plants using producer gas will speedily follow. A central plant could distribute such electric current for a distance of 500 miles; that is, 250 miles in all directions from the plant, thus covering a territory of probably 200,000 square miles—an area nearly four times the size of Illinois. With ten or a dozen of these great central plants located at the various coal-mining centers, the great railroads of the United States could send their trains speeding from the Atlantic to the Pacific Coast.

It would seem ridiculous to predict the immediate doom of the steam locomotive, Professor Fernald says; yet one of the officials of the New York Central Railroad has publicly stated that within 10 years, in his opinion, there will be no steam locomotives operating on the New York Central road. Already the New York Central has substituted electric for steam power on its lines from New York city to a point about 40 miles from the Grand Central Station, and it is rumored that before long electric trains will be running regularly on this road from New York to Buffalo.

These rapid changes are leading to one end—the centralization of power development and distribution. They point to the time, and at no distant day, Professor Fernald believes, when great central plants will be located at mine centers, and the electric power will be transmitted and distributed to railroads, industrial plants, cities, and the various institutions where electrical energy is needed. The great railroads will operate their trains by electricity, passengers and the country-side will be freed from the annoyance of smoke and cinders, while disastrous forest fires caused by sparks from locomotives will become a thing of the past.




An aggregate of 50 feet of Lignite Strata, lying between Dickinson and Medora, North Dakota, a distance of 40 miles.



A GOOD LIGNITE OUTCROP NEAR TYONEK, ALASKA

A LIGNITE LEDGE: KENAI PENINSULAR COAL-FIELD, ALASKA

### ASTONISHING WASTE OF ENERGY IN STEAM PLANTS

From the standpoint of conservation, the producer-gas experiments and the rapidly increasing installations of gas-producing plants are notable advances. Stated in terms of wasted energy, the figures of fuel consumption become deeply impressive.

Incredible as it may seem, the fuel consumed in the ordinary manufacturing plant operated by steam power yields less than 5 per cent of its available energy in useful work; the other 95 per cent is wasted. The superintendent of motive power of the New York subway system, one of the most efficient steam plants in existence today, estimates the total losses in a year's operation of the plant at about 90 per cent—the utilized energy at only 10 per cent. As against this, it is estimated that a producer-gas plant operated on a similar scale would utilize over 21 per cent of the available energy in the fuel consumed.

Not only will the ultimate complete substitution in the United States of the gas engine entail a direct saving of millions of tons of coal annually, but, through the utilization of the lower-grade coals and lignites, which would otherwise never be mined, it will greatly lengthen the life of the high-grade coal deposits.

### LIGNITE BRIQUETS

Another feature of interest in connection with the utilization of lignite is the briquetting tests started under the Geological Survey and now being carried on by the Bureau of Mines. Briquets from dust of ordinary coal make almost ideal fuel, but they are expensive to produce. The several per cent of "binder"—tar, pitch, etc.—necessary to make them cohesive runs up the cost. Lignite, however, can be briquetted without binding material; at least, this is done with some of the foreign lignites, and there seems no reason why American lignite as well should not make good briquets. The lig-

ALASKA LIGNITE COAL, EXPOSED FOR THREE YEARS TO WEATHERING AND SHOWING RESISTANCE

nite briquet machine which is being used in the government tests is a huge affair and simply exerts enormous pressure on the lignite, the constituency of which is such that a solid, dense briquet is formed, which makes an admirable fuel. Lignite, converted into cheap briquets, will keep indefinitely and bear transportation. The gas producer has made lignite a great possibility in industrial development; the briquetting machine promises to raise it into the class of a highly valuable domestic and heating fuel.

ENORMOUS LIGNITE AREAS AND TONNAGE

While the older coal fields of the Appalachian region may for some time lead in production, the advent and the continued improvement of the gas producer capable of utilizing the lower-grade fuels will have an important bearing on the distribution of industrial activities. With this feature in mind it will be of interest to inquire into the extent of these little-known lignite coals.

The latest field investigations of the United States Geological Survey show that North Dakota has an area of 31,240 square miles—19,993,600 acres—underlain with lignite. In much of the field there are several beds or seams, sometimes a dozen, one below the other. The tonnage of the State is placed at the stupendous total of 500,000,000,000 tons. As compared with this, the total tonnage estimated for the great coal fields of Pennsylvania, both anthracite and bituminous, is 112,500,000,000, and the importance of the advent of the gas producer is recognized when it is realized that every ton of the North Dakota coal has more driving power, utilized in the gas engine, than a ton of the very best of the Pennsylvania coal used in steam plants.

Montana will be a rich field for the gas plant, since she has an estimated 300,000,000,000 tonnage of lignite and low-grade bituminous coal, as well as some high-grade coal. In the San Juan field of New Mexico the Survey geologists estimate over 130,000,000,000 tons

of subbituminous coal, a grade above lignite and probably of little use for steaming purposes, but efficient in the gas producer. Texas has 23,000,000,000 tons of lignite, utterly worthless, according to the Survey tests, except in a gas plant, where it develops more energy than West Virginia's highest-grade coal. Even Louisiana and Mississippi, which are surely never thought of as coal States, have an area of over 16,000 square miles underlain with lignites. In considering some of these large coal areas, it is something of a shock to find that the great "coal trust," which owns the entire anthracite field in Pennsylvania, has only 480 square miles of coal land. On the coal map issued by the Geological Survey, this hard-coal field appears as an infinitesimal patch.

Summarizing the Geological Survey figures, the total area in the United States underlain by lignite and subbituminous coal—coal mostly of little if any value in steam plants, but of great efficiency in gas producers—is 246,245 square miles, or over 150,000,000 acres, and its tonnage is 1,393,423,000,000 short tons.

The tonnage of the lignite is calculated on the basis of about 1,800 tons per acre, one foot deep. Thus, if an acre is underlain with, say, two 4-foot seams, it will contain 14,400 tons of lignite. A square mile would contain 9,216,000 tons. In the tonnage estimates of the lignite fields, under the regulations of the Interior Department no account is taken of the deposits below 1,000 feet. If the estimates included the lignite found down to the 3,000-foot depth, as they do in the higher-grade coal, the tonnage would be immeasurably increased. It is interesting to note, in this connection, that the deepest mine in the world—in Belgium—in which coal is mined, approximately 4,000 feet below surface, is a lignite mine.

### ALASKA'S LARGE LIGNITE DEPOSITS

Mention of Alaska's lignite deposits should not be omitted. About one-half of the Territory's coal is believed to be lignite, and, while there is not sufficient information upon which to base even an approximate estimate of the total tonnage of the various fields, it is probable that the reserve of lignite may be 500,000,000,000 or more tons.

To better comprehend the extent of this new resource, discovered in fact through the gas producer, the amount of coal already mined in the United States may be compared with the estimated reserves. Since mining first began the total amount of coal produced and the amount wasted in mining has been, to January 1, 1910, approximately 12,000,000,000 tons, which is a little more than one-half of what yet remains underground in the little 480 square miles of the anthracite field. The 1909 production was about 450,000,000 tons, with perhaps a recovery of 60 per cent—40 per cent being lost in mining—or a total exhaustion of 750,000,000 tons last year. This is just fifteen-hundredths of one per cent of North Dakota's easily accessible lignite.

### VALUE OF PEAT

The improvement of the gas-producer plant has also brought into the field another natural resource heretofore considered of little if any fuel value, namely, peat. The knowledge of the area and tonnage of our peat deposits is incomplete; but they are very great, both in the United States and Alaska.

It is significant, too, that the regions in the United States that have peat beds of workable size and depth are found to lie almost entirely outside the territory in which the coal fields and supplies of other natural fuels are known to exist in abundance. The Geological Survey's estimate of twelve billion (12,000,000,000) tons of air-dry fuel as the product of the peat beds of the country, exclusive of Alaska, is believed to be an ultra-conservative one. Peat beds occur throughout Minnesota, Wisconsin, Michigan, New York, New England, New Jersey, Florida, in the eastern part of the Dakotas, barely infringing upon the lignite beds; northern Iowa, Illinois, Indiana, Ohio, Pennsylvania, Virginia,

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North Carolina, South Carolina, and Georgia, and along the Pacific coast.

In Alaska no attempt has been made to estimate either the acreage or tonnage of peat. Professor Davis, the author of several Geological Survey reports on peat, states that the conditions throughout the greater part of Alaska favor the formation of peat, and he makes mention of many beds in the southern part of the Territory having a thickness of 15 or 20 feet. In the northern portion he speaks of peat beds 8 and 10 feet, and of others 30 and 40 feet deep which have been exposed by natural agencies. It seems evident, he says, that peat beds of workable extent are to be found in most parts of Alaska.

As a fuel for the making of producer gas, peat has an important place. In a country so marvelously endowed with wood, coal, petroleum, and natural gas, it has been assumed that peat has no place as a fuel, except in the far-distant future. However, inasmuch as transportation charges enter largely into the ultimate cost of fuels, and since peat is found in regions remote from other fuel supplies, it is coming to be recognized that its utilization may mean the establishment of manufacturing industries in many parts of the country at a distance from coal centers.

Like coal, peat varies in quality; but, of the tests made, some of it has been found the equal and even the superior of certain of the lignite coals, while in the gas producer it has developed more horse-power than the highest-grade coal in steam plants, ton per ton. Its theoretical heating value is between that of good wood and good coal. It carries from five-eighths to five-ninths the calorific value of the best bituminous coal.

# KBOO, A LIBERIAN GAME

By G. N. Collins

OF THE multitude of intellectual games in vogue among civilized people, chess and draughts can alone be classed as games of pure skill, entirely free from chance. These are both supposed to have come to us from southern Asia.

A third game, equally free from chance, and, like chess, affording unlimited opportunity for the exercise of mental skill, is played over the whole of Africa and southern Asia, and by the negroes of the West Indies, but seems never to have been taken up by European races.

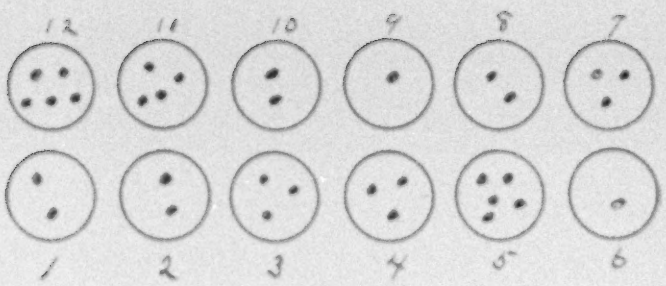
The game is most widely known by its Syrian name, *mancala*. A form of this, called *kboo*, or *boo*, is the only game of skill played by the Golah people of Liberia. Kboo is purely arithmetical, and it seems remarkable that natives who are unable to even give names to the numerals above 30 can excel in the intricate mental calculations of this game. The same man who was able to plan and execute a long series of complicated moves in this game would calculate the price for whip-sawing lumber by measuring only the width of the boards, disregarding their length.

The game as played by the natives of Liberia consists of a boat-shaped board (see figure on page 945), with 12 cup-shaped depressions arranged in two parallel rows of 6 each. The board in the writer's possession is made of some heavy dark wood, colored black and highly polished. The counters, or "men," are seeds of a leguminous plant, and are about the size of small kidney-beans.

The two players sit with the board placed crosswise between them, one row of holes being guarded by each player. At the beginning of the game each hole contains four seeds. To begin the play, one of the players takes all the seeds from any one of the holes on his side and drops one in each of the succeeding holes around the board, playing from

left to right, or counter-clockwise. His opponent does likewise, playing from any hole on his side. As soon as play commences, some holes are of course left empty and others receive more than the four seeds. In subsequent plays these empty holes will again receive one or more seeds.

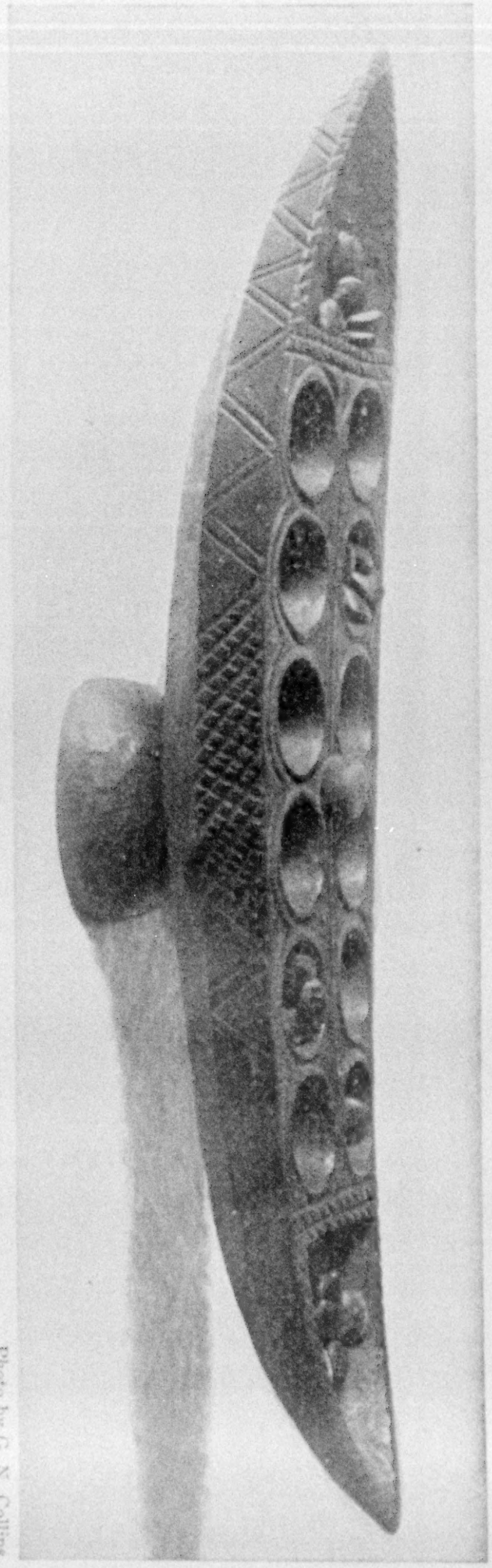
One of the objects of the game is to play from such a hole that the last seed will fall in one of the holes on the opponent's side which contains either one or two seeds. When this occurs, the seeds in this hole, together with the seed dropped, are removed and count in favor of the player making the play. If any holes immediately preceding that from which such a "catch" is made contain one or two seeds, the whole series are also removed until a hole is reached that was either empty or contained more than two seeds. This play can be best explained by the following diagram:




If the player guarding the lower row of holes elects to play from hole number 5, the first of the five seeds would fall in hole number 6, the next in 7, and the last in 10. Since hole 10 contained two seeds, the three which it would contain after the play would be "caught," as well as the two in 9 and the three in number 8. The seeds in 7 would be safe, since they are more than two. Seeds can only be caught from an opponent's side.

The play continues until there are no seeds left on one or the other side when it is that player's turn to play. The game is then finished and all seeds remaining on the board count for the player on whose side they remain, and are added to those already caught. The player having the most seeds wins the game.

With skilled players the seeds caught during the game seldom play an important part, the principal effort being di-



THE BOAT-SHAPED BOARD USED IN THE LIBERIAN GAME KBOO
This game in slightly different forms is played over all Africa

Photo by G. N. Collins

Photo by G. N. Collins

GOLAH MEN PLAYING KBOO

Photo by G. N. Collins

GOLAH "HEADMAN," A SKILLFUL KBOO PLAYER AND AN INVETERATE GAMBLER

rected toward manipulating the play so that the seeds are accumulated on one side, leaving the other player with none. An important factor is the ability to properly estimate an opponent's skill; an elaborately planned campaign may be entirely frustrated by unexpected stupidity on the part of an opponent, as well as by superior skill.

The illustration on page 946 shows two natives playing this favorite game. The posture, which would be so uncomfortable to any European, is characteristic and perfectly comfortable for these natives.

On first acquaintance this game may seem childish, but as soon as a few games have been played the possibilities of strategy, feint, and decoy become apparent and the game will be found intensely interesting. The principle is entirely different from that of either draughts or chess, both of which depend on space relations, while kboo is entirely arithmetical. Although different forms of this game have been frequently described in technical publications,* no serious effort seems ever to have been made to introduce this African game among European people.

The Golah "headman," whose picture is shown on page 947, was the most skillful player I ever met. The long rainy season of Liberia afforded ample opportunity for practice, but as fast as the moves of my Golah adversary were mastered he inaugurated new methods, before which I was equally helpless.

* Lane, E. W.: Manners and Customs of the Modern Egyptians, p. 315.

Culin, S.: Mancala, The National Game of Africa. Report U. S. Nat. Mus. for 1894 (1896), p. 597.

Avelot, R.: Bull. Soc. d'Anth., Paris, 1906, pp. 267-271, and 1908, pp. 9-21.

Golberry: Fragment d'un voyage en Afrique. Paris, 1791, Vol. II, p. 480.

# THE PEST OF ENGLISH SPARROWS*

By N. Dearborn

THE English sparrow among birds is comparable to the rat among mammals. It is cunning, destructive, and filthy. This sparrow was introduced into America about 60 years ago, and is now distributed generally over the eastern half of the United States and southern Canada and locally westward to the Pacific coast. This rapid increase is a result of the bird's hardiness, extraordinary fecundity, diversity of food, aggressive disposition, and almost complete immunity from natural enemies through its sagacity and its preference for thickly settled communities.

Its natural diet consists of seeds, but it eats a great variety of other foods. While much of its annual fare consists of waste material from the streets, in autumn and winter it consumes quantities of weed seed, and in summer numerous insects. Aside from the destruction of weed seed, there is very little to be said in the sparrow's favor.

It destroys small fruits, as cherries, grapes, pears, and peaches. It also destroys buds and flowers of cultivated trees, shrubs, and vines. In the garden it eats seeds as they ripen, and nips off tender young vegetables as they appear above ground, peas and lettuce being especially subject to attack. It damages wheat and other grains when newly sowed, ripening, and in shocks. It reduces the numbers of some of our most useful native species, such as bluebirds, house wrens, purple martins, tree swallows, cliff swallows, and barn swallows, by destroying the eggs and young and by usurping the nesting places. It at-

* Abstracted from "How to Destroy English Sparrows," by N. Dearborn. U. S. Department of Agriculture Farmers' Bulletin 383.

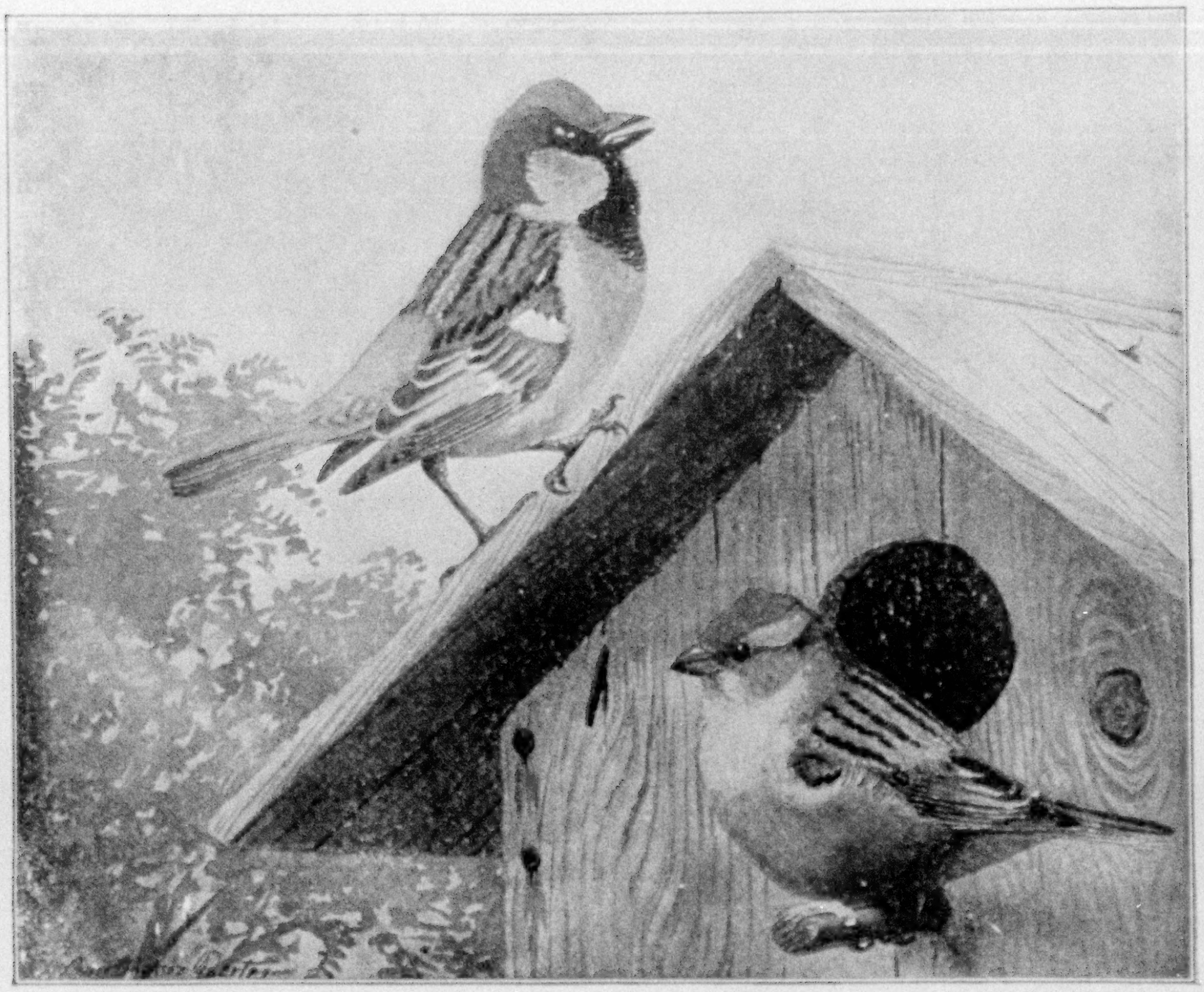


Photo from U. S. Department of Agriculture

ENGLISH SPARROW, MALE AND FEMALE, SHOWING THE MANNER IN WHICH THEY TAKE POSSESSION OF NESTING BOXES PROVIDED FOR NATIVE BIRDS

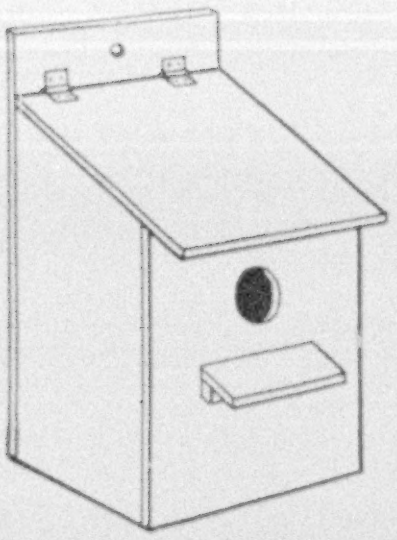
tacks other familiar native birds, as the robin, wren, red-eyed vireo, catbird, and mocking bird, causing them to desert parks and shady streets of towns. Unlike our native birds whose places it usurps, it has no song, but is noisy and vituperative. It defiles buildings and ornamental trees, shrubs, and vines with its excrement and with its bulky nests.

The evidence against the English sparrow is overwhelming, and the present unfriendly attitude of the public toward it is reflected in our State laws. Nowhere is it included among the birds that are protected. In response to frequent inquiries for means of abating the sparrow nuisance received by the United States Biological Survey, a few approved methods applicable to different conditions are here described.

Sparrows frequently give annoyance by roosting in ornamental vines and in crevices about buildings. If driven out late at night, several nights in succession, they will usually desert the roost. A jet of water from a garden hose is a potent disturber, particularly on frosty nights. Where water is not available, small Roman candles may be employed.

Though sparrows may be driven from a given neighborhood, the relief thus obtained is only temporary, and has the further objection that the nuisance is simply transferred elsewhere. More drastic action is therefore preferable.

The most effective method of prevent-



AN INEXPENSIVE NEST BOX FOR ENGLISH SPARROWS

ing the increase of sparrows in a locality is to destroy their nests at intervals of ten or twelve days throughout the breeding season. Occasionally they build large covered nests in trees, but as a rule they build open nests in bird-houses, electric-light hoods, cornices, waterspouts, and similar places. While it is often difficult to reach nests with the hand, they can usually be torn down by means of a long pole having an iron hook at the tip. By a concerted and continued movement to destroy every nest after the eggs are laid, English sparrows in any locality may be gradually reduced without resorting to shot or poison.

The sparrow's habit of nesting in cavities can be turned to account against it. By providing one-room bird-houses, or even packing boxes or tin cans, and putting them in trees or on poles or buildings at a height of about 10 feet, the birds may be captured after dark with the aid of a long-handled net. This net should have a deep bag and a small hoop made to fit the front of the boxes closely. After the net has been quietly placed over the entrance, a few raps on the box will send the tenant into it. Dilapidated buildings may sometimes be fitted up for catching sparrows in this way, as well as for destroying their nests and eggs. The figure on page 951 shows how this can be done. An ordinary wooden box may be nailed to the inside of the building over a hole made to admit the sparrows. The box should be arranged so that the top or upper part of the back can be lifted to gain access to the inside.

The box, also illustrated on this page, is designed to be hung on a building or a tree. Its floor should be about 6 inches square and its height at the eaves about 8 inches. The roof should be hinged at the top for removing the eggs or young. Such boxes may be built of rough boards at slight cost. By distributing a number of them about orchards, shade trees, and out-buildings, and catching the sparrows that occupy them, or by destroying eggs, the work of extermination may be carried on at a season when other methods are least effective.

Preliminary to the following destructive measures, sparrows should be baited until they are attached to the spot selected for their execution. Seeds, grain, or waste from the table, if supplied regularly, will soon establish a feeding place. If a general campaign is to be undertaken, enough such feeding places should be maintained to attract to them practically all the English sparrows in the neighborhood. This can easily be done in winter when food is scarce. After thus baiting the sparrows they may be trapped, shot, or poisoned.

Traps alone are inadequate to exterminate sparrows, but a reduction of numbers can be effected by using a shallow box not less than 4 feet square, open on one side and covered with woven wire on the other. One side of this trap rests on the ground, while the opposite side is supported by a stick 18 inches long. Near the upper end of this stick is attached a long cord, and between the top of it and the edge of the trap is placed a chip. By setting the trap over bait and pulling the cord from a sheltered point of observation when a flock of sparrows is beneath it, numbers of them may be caught. Instead of the box described above, by which the birds are taken alive, an old door or similar device may be employed as a deadfall. In either case the trap should be kept set and baited until the sparrows are not afraid

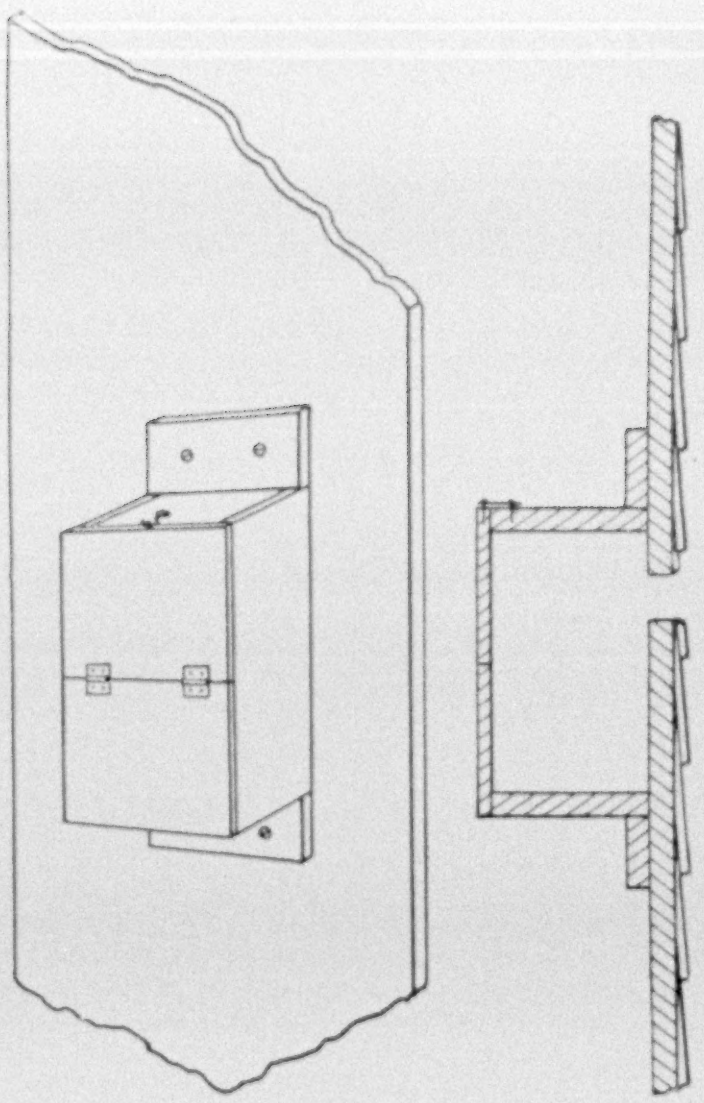
to go under it. The best time for trapping is just after a snowstorm, when the birds have been fasting. Then, if the ground be cleared and chaff and grain be put under the trap, the birds will crowd in and enable the trapper to secure nearly all of the local flock. If any escape they will spread the fear of traps, and before long very few of the birds can be induced to go into one.

Sparrows are accustomed to feed in close flocks, and when thus assembled a large number can be killed by a charge of No. 10 shot. The best way is to scatter grain over long, narrow areas and shoot the sparrows at these baiting places. Where sparrows infest poultry yards, the bait may be placed on a horizontal board, supported at such an elevation that the birds can be shot without danger to the poultry.

Since English sparrows are a pest and a reduction of their numbers is important on economic grounds, there would seem to be no reason why the birds, when trapped or shot, should not be utilized for food in this country, as they have been in the Old World for centuries. Their flesh is palatable and nutritious, and in city restaurants they are often served under the name of reed birds.

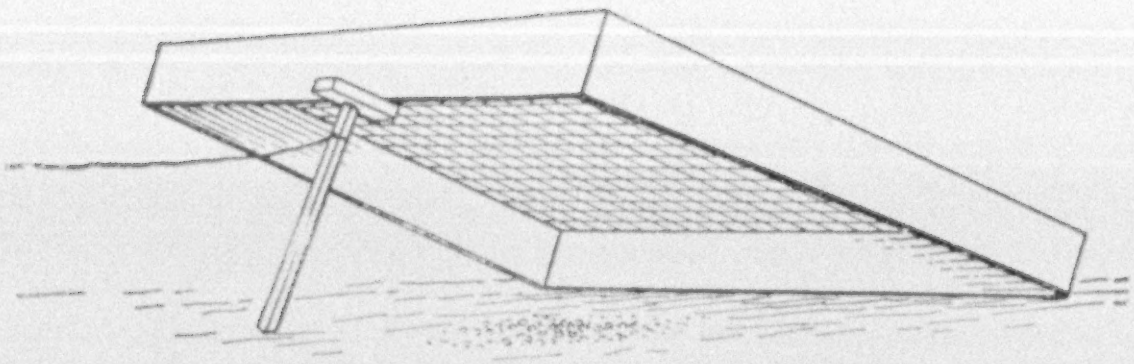
Where the use of poison is not prohibited by law, it may be effectively used to reduce the number of sparrows. Of the different poisons tested, the most satisfactory is strychnia sulphate. It is easily prepared and acts quickly. Wheat has proved to be a good bait, as well as an excellent vehicle for administering the poison. The grain should be regularly supplied at the baiting stations until the birds have become accustomed to resort to the place. A good time to put it out is early morning, as the birds are sure to be hungry for breakfast. The capacity of the sparrow's crop and stomach is about 30 kernels of wheat, varying according to size of the kernels.

In deciding the amount of poisoned wheat to put out at one time, it is well to estimate the number of sparrows frequenting a feeding place and to allow about 20 kernels for each sparrow.



PERSPECTIVE AND SECTIONAL DRAWINGS OF AN IMPROVISED NESTING-BOX FOR THE INTERIOR OF BUILDINGS

Although 2 kernels of wheat coated with the solution described below have been known to kill a sparrow, 6 or 7 kernels are required to insure fatal results. Only as much poison should be put out as is likely to be eaten in one day, as exposure to moisture reduces its virulence. Furthermore, sparrows that take less than a fatal quantity, or that become frightened by the death of comrades, will forsake a feeding place if poison is kept there constantly. It is better, therefore, to supply unpoisoned wheat after each poisoning until the birds have recovered confidence. An important advantage in having several feeding grounds is that they may be used in rotation, the sparrows forgetting their fear of one while the others in turn are receiving poison.



A SPARROW TRAP

A poison mixture that has proved very effective is prepared as follows: Put one-eighth ounce of strychnia sulphate into three-fourths of a gill of hot water and boil until dissolved. Moisten 1½ teaspoonfuls of starch with a few drops of cold water, add it to the poison solution, and heat till the starch thickens. Pour the hot poisoned starch solution over 1 quart of wheat and stir until every kernel is coated. Small-kerneled wheat sold as poultry food, if reasonably clean, is preferable to first-quality grain, being cheaper and more easily eaten by the sparrows. A 2-quart glass fruit jar is a good vessel to mix in, as it is easily shaken and allows the condition of the contents to be seen. If the coated wheat be spread thinly on a hard, flat surface, it will dry enough for use in a short time. It should be dried thoroughly if it is to be put into jars and kept for future use. Dishes employed in preparing poison may be safely cleansed by washing.

The poison should be well scattered, so that many birds may be able to partake at the same time, since after a few are affected their actions excite the suspicion of their comrades. Usually a few sparrows get only enough strychnine to paralyze them for a few hours, after which they recover. It is important, therefore, to visit the feeding places two or three hours after distributing poison to prevent such birds from escaping. It is well also to remove dead birds promptly to avoid exciting the suspicions of those that are unaffected. In northern latitudes the best time to put out poison is just after a snowstorm, when other food is covered. The feeding place should be cleared of snow and the poison laid early in the morning.

Sparrows should be baited in secluded places, safe from interruptions and where doves and poultry are not endangered. Roofs, back yards, and unused poultry runs are favorable situations. Proximity to low trees, grape arbors, and similar retreats has the advantage that sparrows go to such places between meals, and many dead birds will be found there well away from the bait. If undisturbed, poisoned birds will usually be found within a few feet of where the bait was spread, death occurring in from three to twenty minutes. Where doves or poultry are likely to be poisoned, the sparrows, after being baited, may be induced to feed in small covered pens made of coarsely meshed wire netting and having the sides raised about an inch and a half above the ground. There is practically no danger that cats or other animals will die from eating sparrows that have been poisoned. Any wheat coated by the above process, which is overlooked by the birds, will become harmless after a few rains.

Sparrows can be reduced locally to almost any desired extent by the methods outlined above, but it should not be forgotten that such reduction can be made permanent only by systematic and continued efforts.

XUM

# MR ROOSEVELT'S "AFRICAN GAME TRAILS"*

IN these greatest of the world's great hunting grounds there are mountain peaks whose snows are dazzling under the equatorial sun; swamps where the slime oozes and bubbles and festers in the steaming heat; lakes like seas; skies that burn above deserts where the iron desolation is shrouded from view by the wavering mockery of the mirage; vast grassy plains where palms and thorn trees fringe the dwindling streams; mighty rivers rushing out of the heart of the continent through the sadness of endless marshes; forests of gorgeous beauty, where death broods in the dark and silent depths.

"There are regions as healthy as the northland, and other regions, radiant with bright-hued flowers, birds, and butterflies, odorous with sweet and heavy scents, but treacherous in their beauty and sinister to human life. On the land and in the water there are dread brutes that feed on the flesh of man, and among the lower things that crawl, and fly, and sting, and bite, he finds swarming foes far more evil and deadly than any beast or reptile—foes that kill his crops and his cattle; foes before which he himself perishes in his hundreds of thousands. . . .

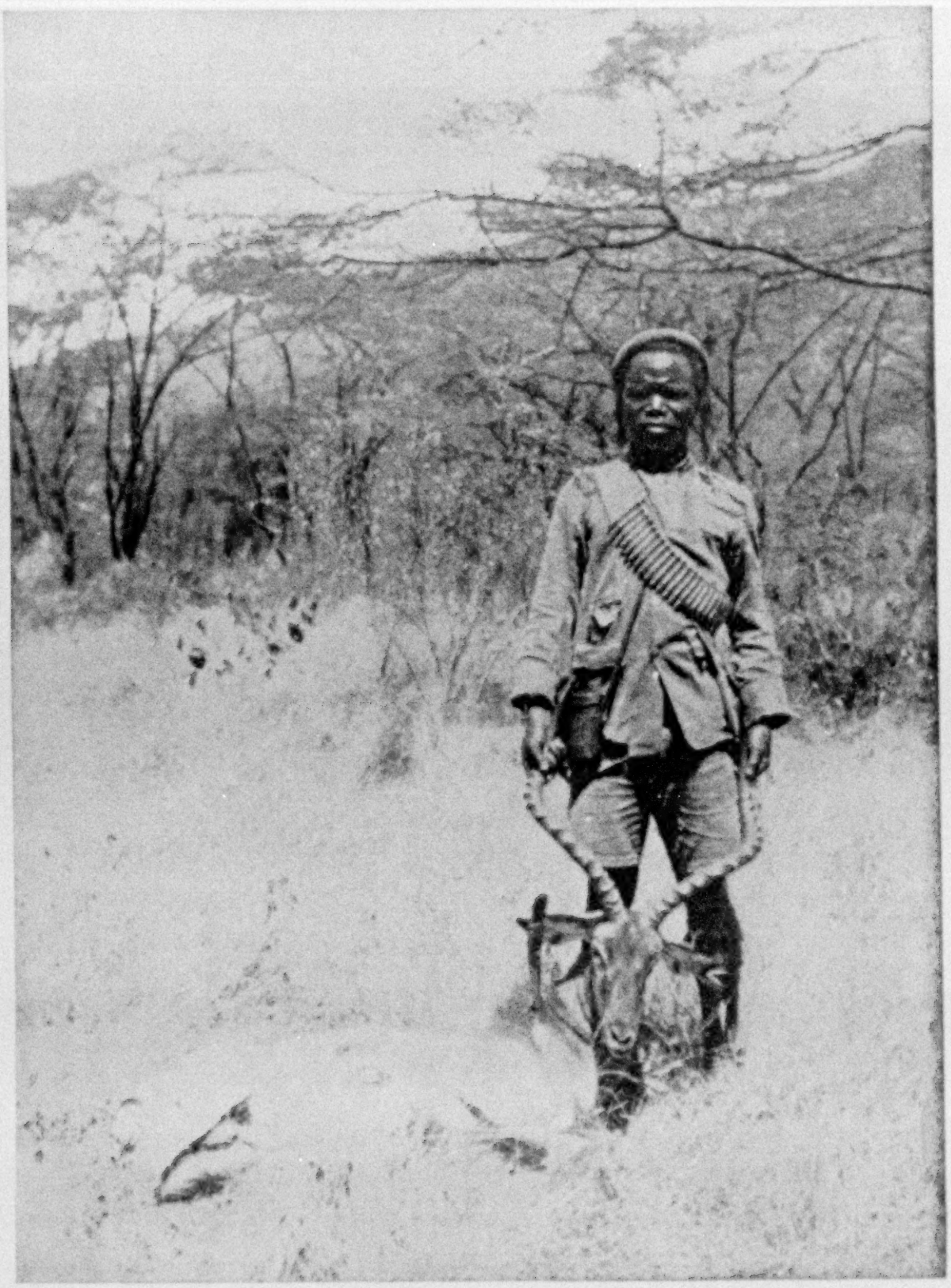
"The land teems with beasts of the chase, infinite in number and incredible in variety. It holds the fiercest beasts of ravin, and the fleetest and most timid of those beings that live in undying fear of talon and fang. It holds the largest and the smallest of hoofed animals. It holds the mightiest creatures that tread the earth or swim in its rivers; it also holds distant kinfolk of these same creatures, no bigger than woodchucks, which dwell in crannies of the rocks and in the treetops. There are antelope smaller than hares, and antelope larger than oxen. There are creatures which are the

From "African Game Trails," by Theodore Roosevelt. Copyright by Charles Scribner's Sons

THE MONITOR LIZARD ROBBING A CROCODILE'S NEST

From a photograph by J. Alden Loring

*African Game Trails. An account of the African wanderings of an American Hunter-Naturalist. By Theodore Roosevelt. With illustrations from photographs by Kermit Roosevelt and other members of the Expedition, and from drawings by Philip R. Goodwin. New York: Charles Scribner's Sons. 1910. $4.00 *net*.



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AN IMPALLA BUCK KILLED BY KERMIT ROOSEVELT AT LAKE HANNINGTON, SHOWING THE BROKEN HORN OF ANOTHER RAM IMBEDDED IN ITS NECK

From a photograph by Kermit Roosevelt

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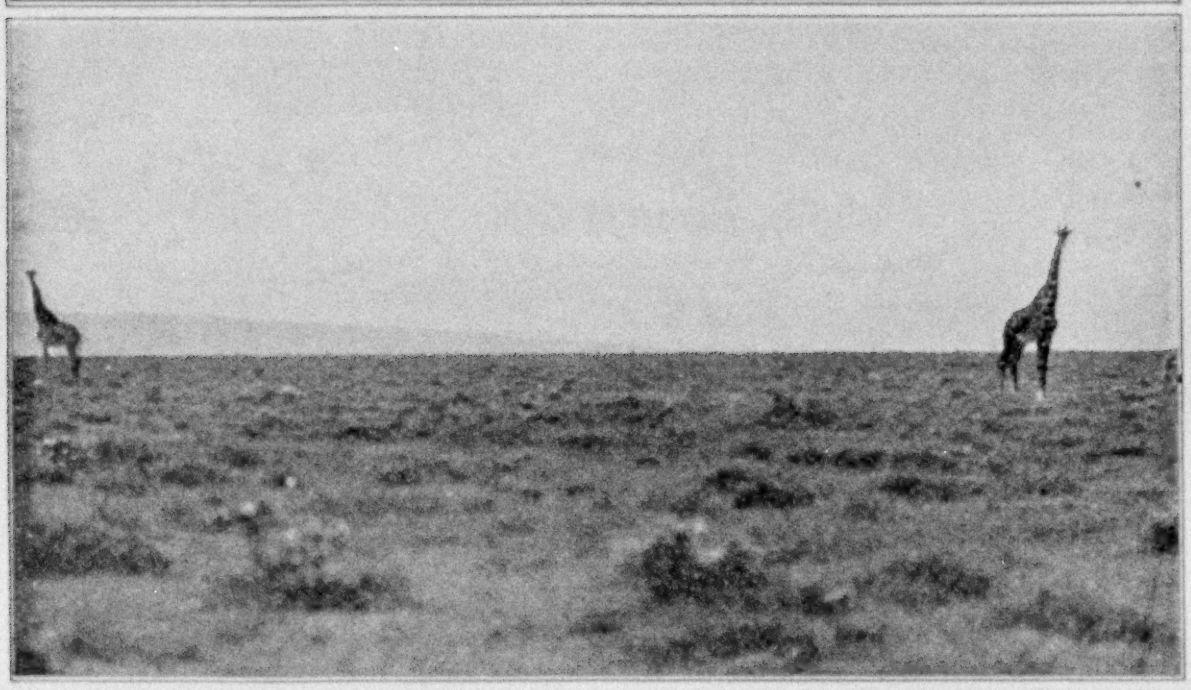

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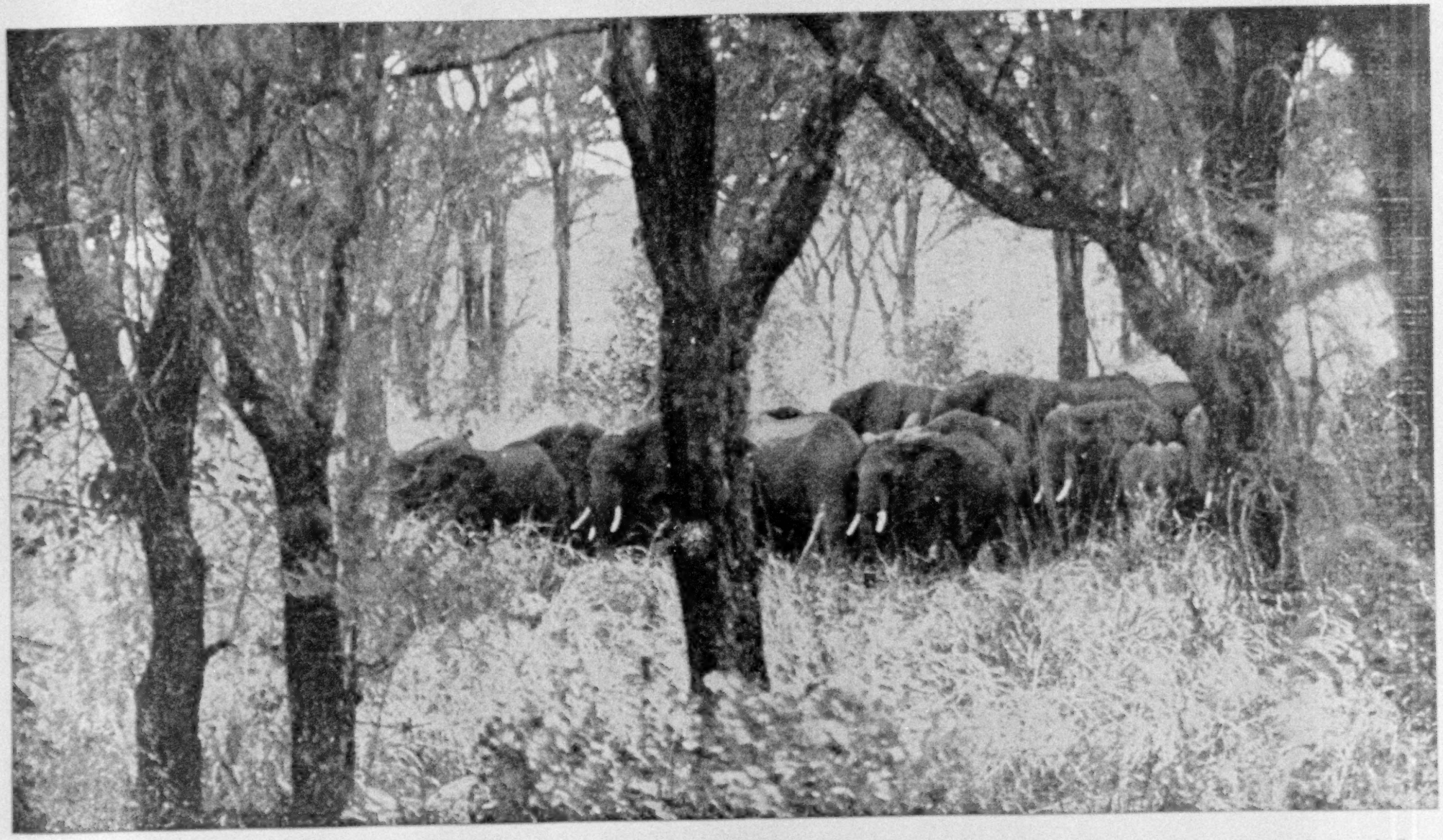
GIRAFFE AT HOME

From photographs by Kermit Roosevelt



From "African Game Trails," by Theodore Roosevelt. Copyright by Charles Scribner's Sons

ONE OF THE MOST REMARKABLE PHOTOS OF WILD GAME EVER MADE: A HERD OF ELEPHANT IN AN OPEN FOREST OF HIGH TIMBER

From a photograph by Kermit Roosevelt, taken from a distance of about twenty-five yards; he was on the dead limb of a tree five or six feet from the ground

From "African Game Trails," by Theodore Roosevelt. Copyright by Charles Scribner's Sons

AS THE LION FELL HE GRIPPED A SPEAR-HEAD IN HIS JAWS WITH SUCH TREMENDOUS FORCE THAT HE BENT IT DOUBLE (SEE PAGE 960)

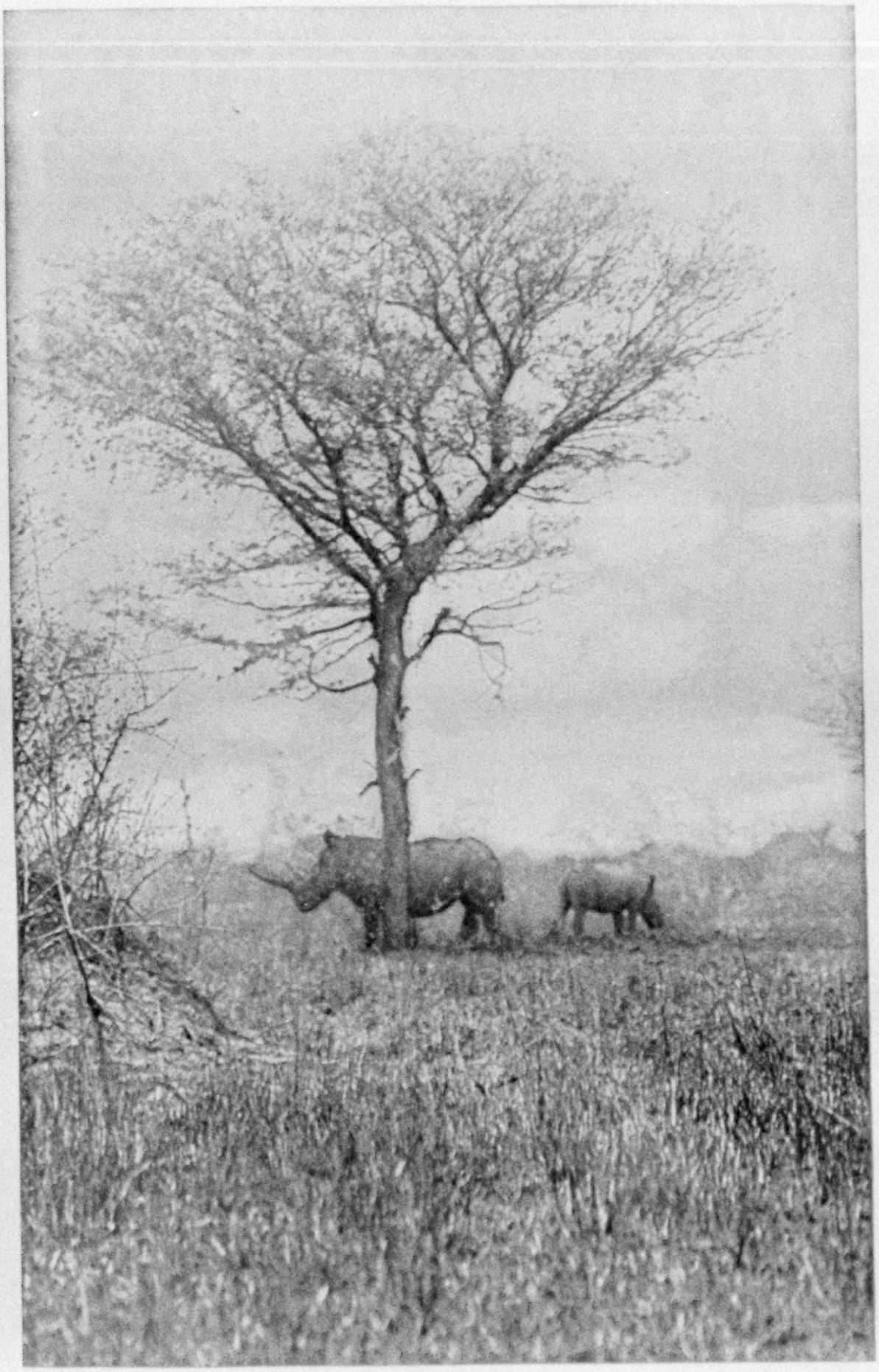
From a photograph by Kermit Roosevelt

embodiments of grace, and others whose huge ungainliness is like that of a shape in a nightmare."

The preceding paragraphs, quoted from Mr Roosevelt's foreword to the narrative of his African expedition, introduce the reader to the wonder world where he collected specimens for the National Museum for nearly one year. The sights which he saw are described so vividly and accurately that even the most quiet and unimaginative citizen thousands of miles from the scene of Africa's grandeur can easily picture the extraordinary contrasts which remain so fixed in Mr Roosevelt's mind, and is also stirred by the wondrous beauty and weird surroundings which Mr Roosevelt so keenly enjoyed.

The book is an unusual contribution to science, geography, literature, and adventure. Naturalists will prize the accurate descriptions of the huge beasts by a hunter-naturalist who for 30 years had been studying the big game of America in their native haunts, and who has contributed much to a better appreciation of the large animals of our continent. Mr Roosevelt's acquaintance with big game in America prepared him to observe the great bulky creatures of Africa with eyes quick to note and understand. He is the first naturalist of much experience with American big game to study all the large species of Africa, so that his comparisons and observations form a particularly valuable contribution to knowledge.

The geographer will perhaps be even more interested in the accounts of the people and of the country. In the first chapter, "Through the Pleistocene," he reads of a land where wild man and wild beast do not differ materially from what they were in Europe many thousands of



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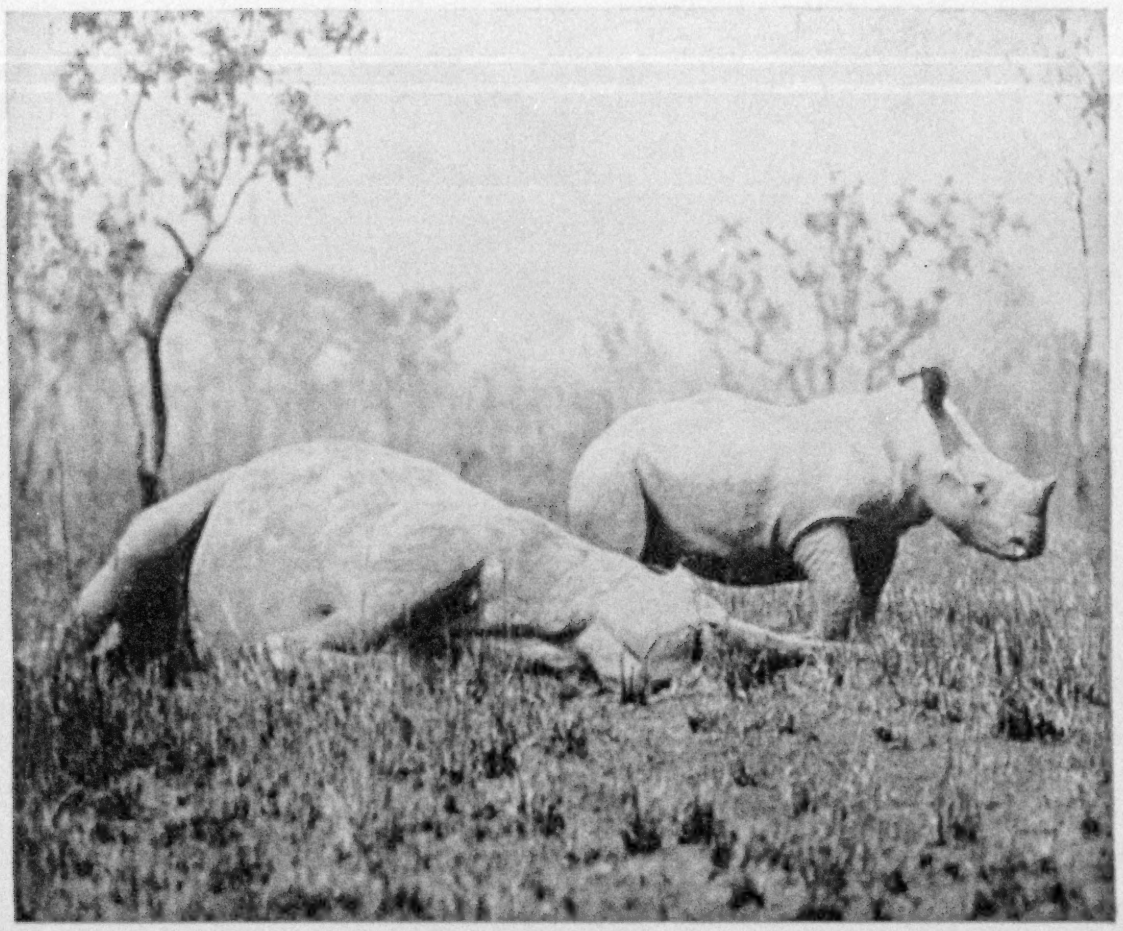
THE COW AND CALF SQUARE-NOSED RHINO UNDER THE TREE AFTER BEING DISTURBED BY THE CLICK OF THE CAMERA

From a photograph by Kermit Roosevelt, whose pictures of white rhino are the first photographs ever made of this rare animal alive



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A WHITE RHINO AND CALF

The calf, which was old enough to shift for itself, refused to leave the body. From a photograph by Kermit Roosevelt

years ago, in the age when our ancestors in Europe went absolutely naked and lived in constant dread of furious beasts. Into this land European civilization is rushing with tremendous sweep and reaping big commercial profits. It is a strange sight as the train, drawn by an American Baldwin locomotive, rolls into the towns to see groups of naked savages with oddly shaved heads and filed teeth, armed with primitive bows and arrows, and women whose ideas of the requirements of dress are fully satisfied by masses of bronze or copper wire wound tightly around the arms and legs.

"One group of women, nearly nude, had their upper arms so tightly bound with masses of bronze and copper wire that their muscles were completely malformed. So tightly was the wire wrapped round the upper third of the upper arm that it was reduced to about one-half of its normal size, and the muscles could only play, and that in deformed fashion, below this unyielding metal bandage. Why the arms did not mortify it was hard to say, and their freedom of use was so hampered as to make it difficult to understand how men or women whose whole lives are passed in one or another form of manual labor could inflict upon themselves such crippling and pointless punishment."

Kermit Roosevelt's photographs of the big game are unusually fine. Those of the elephant herd, of which one is printed on page 956 of this Magazine, are better than any of wild elephants that have ever been taken, while those of the white, or square-nosed, rhino (see pages 958, 959) are, so far as we know, the first live pictures of this rare animal that have ever been made. To photograph the elephant requires especial courage and ability. The huge beast is exceedingly wary and suspicious and easily

aroused to anger. Their strength is prodigious. "They work vast havoc among the young or small growth of a forest, and the readiness with which they uproot, overturn, or break off medium-sized trees conveys a striking impression of their enormous strength. I have seen a tree a foot in diameter thus uprooted and overturned."

The elephant formerly wandered freely over the plains, but, learning some years ago that the open country was becoming dangerous, owing to the advent of the white man and his rifle, he took to the forests and can now be found only after days of fatiguing pursuit in the thickest woods. There is no danger, says Mr Roosevelt, that this magnificent animal will become extinct, because large elephant reserves have been established; and, furthermore, wise regulations have been adopted and are being enforced, such as prohibiting the sale of tusks below a certain size, the shooting of females except for museums, etc.

Not the least interesting portions of Mr Roosevelt's narrative are his descriptions of the small mammals, birds, and the ants, bees, and deadly flies and ticks.

The dreaded driver ants "are carnivorous; I have seen both red and black species. They kill every living thing in their path, and I have known them at night drive all the men in a camp out into the jungle to fight the mosquitoes unprotected until daylight. On another occasion, where a steamboat was moored close to a bank, an ant column entered the boat after nightfall and kept complete possession of it for 48 hours. Fires and boiling water offer the only effectual means of resistance. The bees are at times as formidable; when their nests are disturbed they will attack every one in sight, driving all the crew of a boat overboard or scattering a safari, and not infrequently killing men and beasts of burden that are unable to reach some place of safety."

Among the first specimens obtained were a cow and bull of the ugly wildebeest. "They were covered with ticks, especially wherever the skin was bare. Around the eyes the loathsome creatures swarmed so as to make complete rims like spectacles, and in the armpits and the groin they were massed so that they looked like barnacles on an old boat. It is astonishing that the game should mind them so little. The wildebeest evidently dreaded far more the biting flies which hung around them, and the maggots of the bot-flies in their nostrils must have been a sore torment. Nature is merciless, indeed."

Few of the many millions of Americans who in coming years will admire and profit from the splendid series of specimens of African big game obtained by Mr Roosevelt for our National Museum have any conception of the immense physical labor, the careful planning, and extensive preparations required to secure this complete collection. As an instance of the labor involved, we mention the hunt for the giant eland, the largest and handsomest and one of the least known of African antelopes, described in the last chapter of the book "Down the Nile." This giant antelope with its powerful horns easily breaks off branches two or three inches in diameter and seven or eight feet from the ground to get at the leaves and bean-pods of the tree which forms its favorite food.

This task involved an 8-days' trip from Gondokoro through a hard, dry, barren country and in temperatures of 112 degrees in the shade at noon. Kermit was the only white man to accompany Mr Roosevelt, as all the other white men of the party were down with dysentery or fever.

"It took me three days' work before I got my eland. Each day I left camp before sunrise, and on the first two I came back after dark, while it always happened that at noon we were on a trail and could not stop. . . . On the third day we found the spoor of a single bull by 8 o'clock. Hour after hour went by while the gun-bearers, even more eager than weary, puzzled out the trail. At half past 12 we knew we were close on the beast, and immediately afterward caught a glimpse of it. Taking advan-

tage of every patch of cover, I crawled toward it on all-fours, my rifle too hot for me to touch the barrel, while the blistering heat of the baked ground hurt my hands. At a little over a hundred yards I knelt and aimed at the noble beast. I could now plainly see his huge bulk and great, massive horns, as he stood under a tree." The first shot brought him down. "Meanwhile Kermit had killed two eland—a cow on the first day, and on the second a bull even better than, although not quite so old as, mine. Kermit could see game and follow tracks almost as well as his gun-bearers, and in a long chase could outrun them."

But to save the three big skins in that climate was even harder work than the many hours of hunting had been, but they did it, though it took till midnight to get the skins in proper condition for transportation.

The buffaloes, and particularly the very rare square-nosed or "white" rhino, demanded even greater exertions of the party. Of the square-nosed rhino (see pages 958, 959) only two specimens, and both very poor ones, had been previously secured for any museum, one being at Berlin and the other at London. Mr Roosevelt shot five splendid specimens in the Lado and Kermit four, and all nine animals were saved for the U. S. National Museum.

No one can read the volume without being impressed by the serious purpose of the leader and of every member of his staff. This was in no sense a hunting party for the collection of record heads and horns, but an expedition organized, equipped, and directed by some of the ablest naturalists in the world, all of whom were animated with the sole ambition to bring back some contribution to science.

While the leader and his son were toiling strenuously for the big-game specimens, Major Mearns, Dr Loring, and Mr Heller were collecting and trapping (they took hundreds of traps with them) long series of rats, mice, squirrels, monkeys, shrews, bats, lizards, reptiles, birds, fishes, and plants. Every man had his particular field of work and did it well, with the result that our National Museum will possess the finest and most valuable collection of African fauna in any museum.

Mr Roosevelt during the trip shot with the rifle 296 big game and Kermit 216—a grand total of 512. "Kermit and I kept about a dozen trophies for ourselves; otherwise we shot nothing that was not used either as a museum specimen or for meat—usually for both purposes. We were in hunting grounds practically as good as any that have ever existed; but we did not kill a tenth nor a hundredth part of what we might have killed had we been willing. The mere size of the bag indicates little as to a man's prowess as a hunter, and almost nothing as to the interest or value of his achievement."

To the writer of this review, "African Game Trails" appeals as the strongest and best work of literature Mr Roosevelt has yet written. The word pictures are extraordinarily vivid and realistic. He who seeks stories of adventure will be entranced by the many strange situations, and will rejoice in such descriptions as that of the hunt of a lion by the naked Nandi warriors armed only with shields and spears.

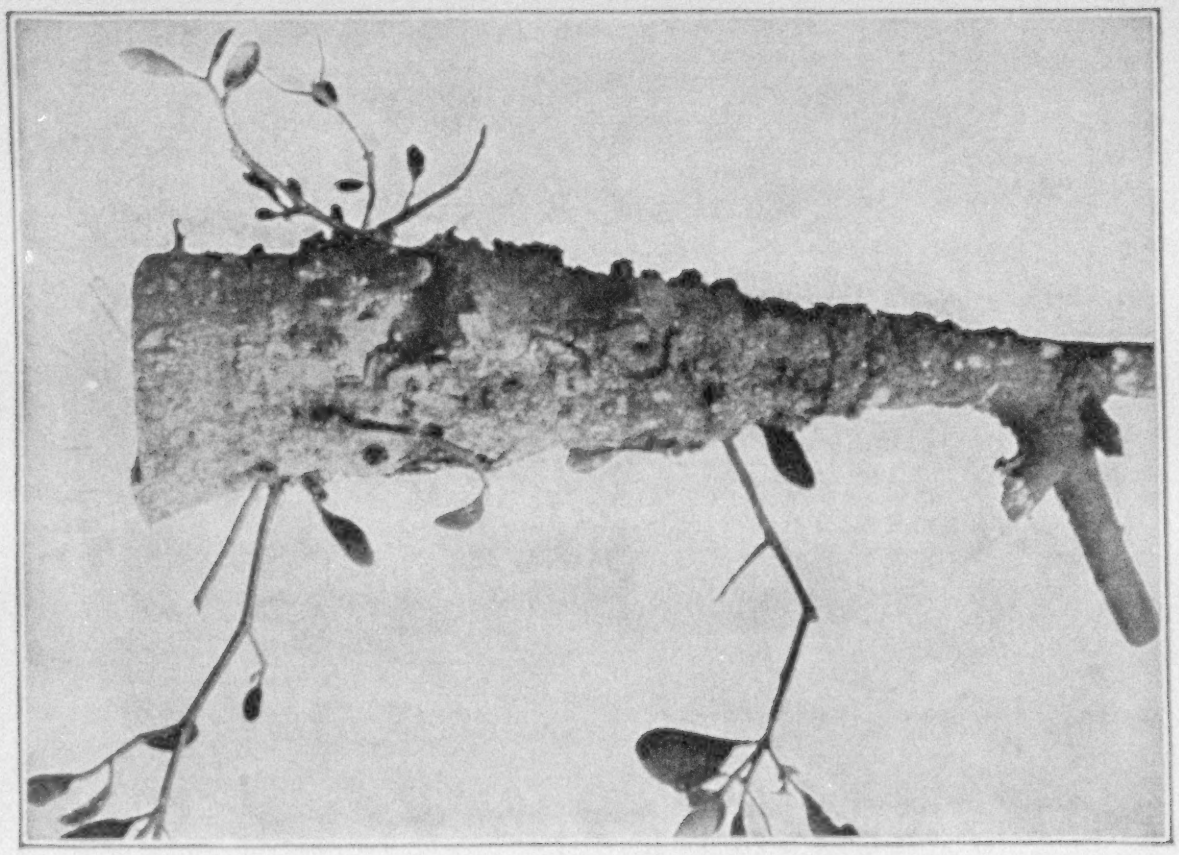
"One by one the spearmen came up, at a run, and gradually began to form a ring round him. Each, when he came near enough, crouched behind his shield, his spear in his right hand, his fierce, eager face peering over the shield rim. As man followed man, the lion rose to his feet. His mane bristled, his tail lashed, he held his head low, the upper lip now drooping over the jaws, now drawn up so as to show the gleam of the long fangs. He faced first one way and then another, and never ceased to utter his murderous grunting roars. It was a wild sight—the ring of spearmen, intent, silent, bent on blood, and in the center the great man-killing beast, his thunderous wrath growing ever more dangerous.

"At last the tense ring was complete, and the spearmen rose and closed in. The lion looked quickly from side to

side, saw where the line was thinnest, and charged at his topmost speed. The crowded moment began. With shields held steady and quivering spears poised, the men in front braced themselves for the rush and the shock, and from either hand the warriors sprang forward to take their foe in flank. Bounding ahead of his fellows, the leader reached throwing distance; the long spear flickered and plunged; as the lion felt the wound he half turned, and then flung himself on the man in front. The warrior threw his spear; it drove deep into the life, for entering at one shoulder it came out of the opposite flank, near the thigh—a yard of steel through the great body. Rearing, the lion struck the man, bearing down the shield, his back arched, and for a moment he slaked his fury with fang and talon. But on the instant I saw another spear driven clear through his body from side to side; and, as the lion turned again, the bright spear blades darting toward him were flashes of white flame. The end had come. He seized another man, who stabbed him and wrenched loose. As he fell he gripped a spear-head in his jaws with such tremendous force that he bent it double. Then the warriors were round and over him, stabbing and shouting, wild with furious exultation.

"From the moment when he charged until his death I doubt whether ten seconds had elapsed, perhaps less; but what a ten seconds! The first half dozen spears had done the work. Three of the spear-blades had gone clear through the body, the points projecting several inches, and these and one or two others, including the one he had seized in his jaws, had been twisted out of shape in the terrible death struggle."*

*All the quotations from "African Game Trails" are copyrighted by Charles Scribner's Sons.



A DEFORMED BRANCH OF A HACKBERRY TREE WHICH HAS BEEN INFECTED BY MISTLETOE FOR TEN TO TWELVE YEARS, NEAR BELTON, TEXAS

The dwarfing of the branch beyond the place of infection is shown. The original mistletoe plant has been destroyed, leaving a decayed spot. The young shoots of mistletoe seen are from adventitious buds.

Photos from William L. Bray, U. S. Department of Agriculture.

A CEDAR ELM TREE ON A VACANT LOT IN AUSTIN, TEX., SHOWING ITS WINTER CONDITION

All the foliage is mistletoe (see page 965)

AN ISOLATED HACKBERRY TREE NEAR BELTON, TEX., WITH INNUMERABLE BUNCHES OF MISTLETOE

This tree is in its winter condition, being absolutely without leaves of its own

MUD-CRACKS IN THE VALLEY OF THE LOWER COLORADO (SEE PAGE 967)

The revolver on one of the central blocks is a .38 Smith & Wesson Military, just 12 inches in total length. This gives an idea of the width of the cracks. Photo by J. Griffin

XUM

THE MUD-CRACKS UTILIZED: BEETS IN THE FOREGROUND, PEAS AT LEFT, WHEAT AT RIGHT, THE LATTER BEING THE CORNER OF A 10-ACRE TRACT (SEE PAGE 967)

At flood-time the previous June water covered this area to a depth of 8 feet, as shown by the mud-stain on willow trunks in the vicinity. Photo taken April 17, 1910, by J. Griffin.

## THE MISTLETOE

PEOPLE living in northern cities who purchase small strings or bunches of mistletoe at a good price for Christmas decoration rarely are aware that it is one of the most destructive tree parasites known. There are localities in the South, particularly in Texas, where mistletoe is so abundant upon trees and so harmful as to make the control of the plant and its extermination a serious practical question. It is spread principally by birds—mocking-birds, robins, wax-wings, and cedar-birds—who carry the mistletoe berry from tree to tree. The sinker of the seedling pierces the tenderest portions of the tree, young branches or buds, and sucks away the tree's vitality by draining the water and nourishment of the tree (see pages 962, 963).

## OUR COLORED PICTURES

IN this number of the Magazine, for the first time, the National Geographic Society publishes a large series of illustrations in color. These pictures are all from photographs taken by Mr William W. Chapin, a well-known citizen of Rochester, New York, and an amateur photographer of much skill. The photographs were colored by hand, under Mr Chapin's direction, by a Japanese artist. By the use of colors, the atmosphere and reality of foreign scenes in many instances can be more accurately and graphically portrayed than in the usual black-and-white illustration. This is particularly true of the Orient, where the use of bright, striking pigments—golden yellows, rich reds and blues and greens—are so prevalent in dress and street deco-

From "Hunting with the Eskimos," by Harry Whitney. Copyright by Century Company

STRIPPING BLUBBER FROM A WHALE

"In these modern factories every part of the whale is utilized. The oil and whalebone of commerce are very valuable, and the manufacture of the carcass into guano after the oil has been extracted is an industry in itself. Until recently the oil-freed carcass was considered useless refuse. It was towed 50 miles out to sea and abandoned. The law required this, that the fishing grounds might not be polluted. But a voyage of 50 miles to sea and back again is costly, and through experiment it was learned, not only that this expense might be saved, but that it was possible to manufacture the refuse into a valuable commodity. So every part of the whale is turned to account except the smell. Human ingenuity cannot control that."—HARRY WHITNEY.

From "Hunting with the Eskimos," by Harry Whitney. Copyright by Century Company

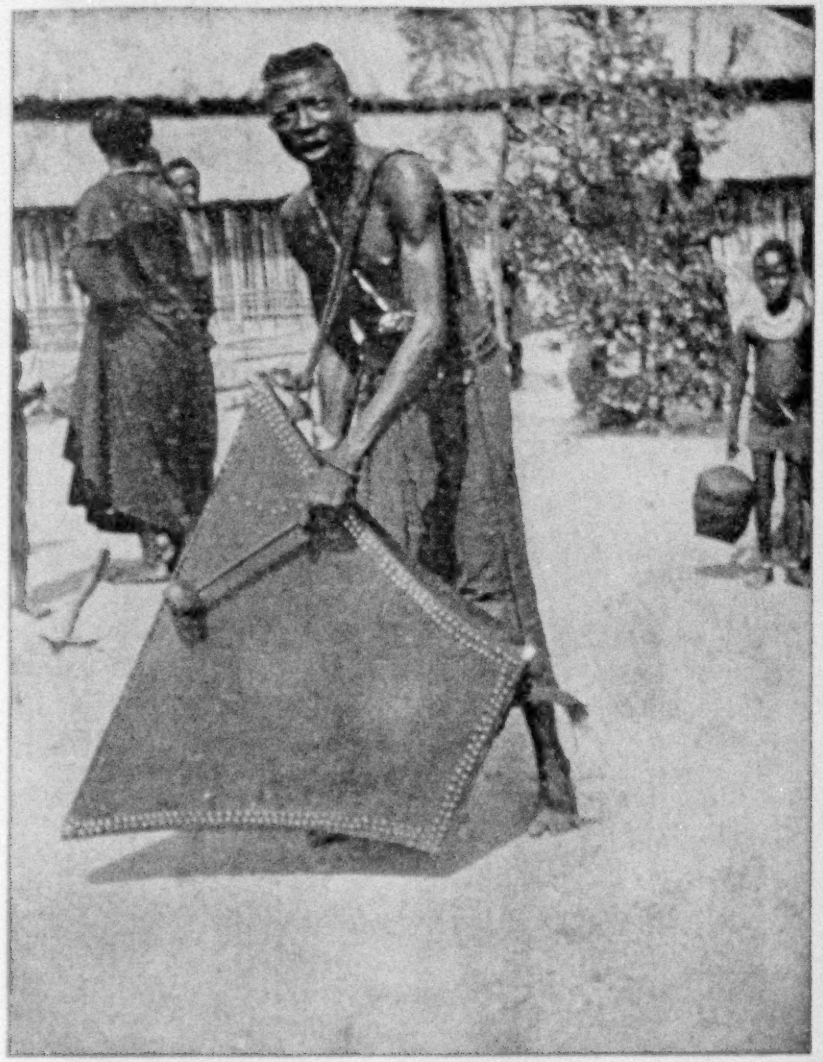
MR HARRY WHITNEY IN A WHALE'S MOUTH

ration and in the architecture of the buildings.

The process by which the 39 pictures were engraved and reproduced for this Magazine cost the Society more than several ordinary issues of the publication, but it is believed that the beauty of the illustrations and the vivid manner in which the striking contrasts of eastern life are actually represented will more than compensate for the expense. The expenditure was made possible by the increasing revenue of the Society from the general sale of the Magazine and from advertising receipts. The Society will be glad to hear from the members what they think of the series, which incidentally is the largest collection of photographs in color ever published in a single issue of any magazine.

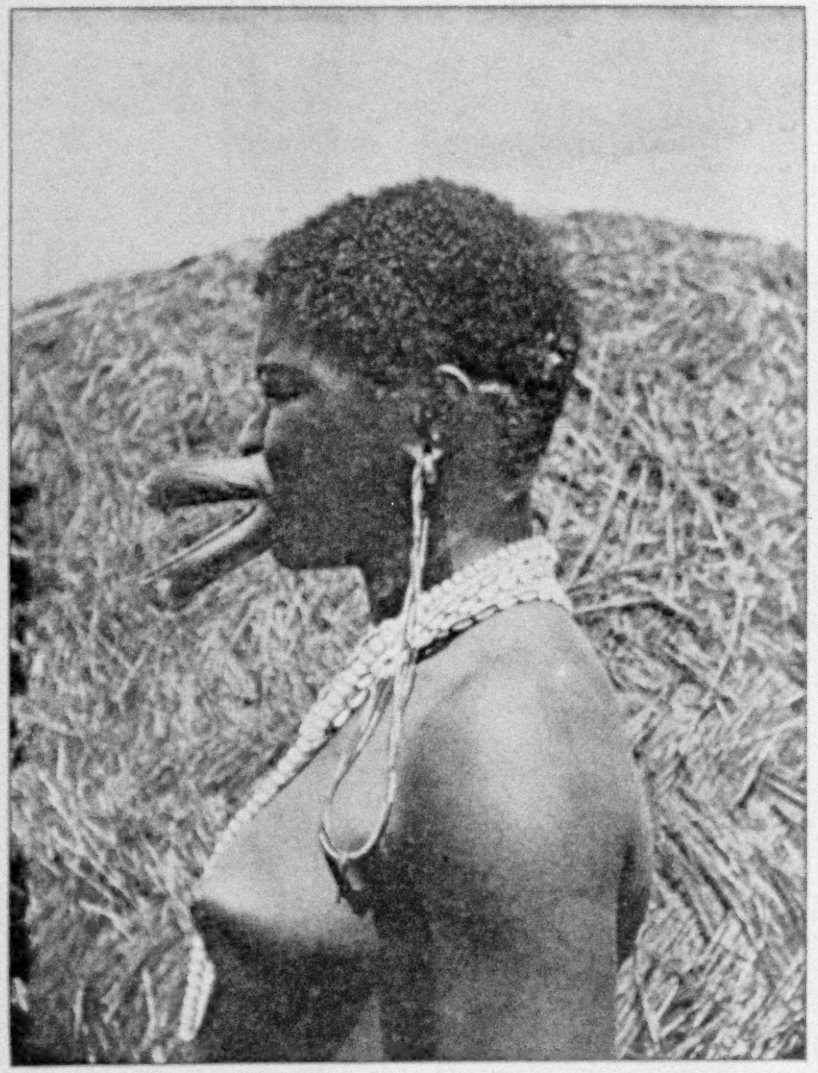
## THE MAN WITHOUT THE HOE

PROBABLY nowhere in the United States is a more unique method of farming practiced than the one carried on by the few dwellers along the banks of the lower Colorado River, on the Cali-



A BATETELA DRUMMER OF THE BELGIAN CONGO SENDING A MESSAGE BY A WOODEN GONG

The natives of this part of Africa are celebrated for their proficiency in transmitting elaborate messages long distances by means of these resonant instruments. The women of these people wear enormous neck-rings of brass which frequently exceed 30 pounds in weight. Photo from E. Torday, in the Geographical Journal of London.



A BEAK-FACED WOMAN IN THE MUSGUN COUNTRY OF FRENCH NIGERIA, NEAR LAKE TCHAD

These people are magnificent specimens of humanity, but their women are exceedingly ugly. The upper and lower lips of their wives are pierced and have large discs of tin looking-glass and Maria Theresa dollars inserted in them. Photo from Dr Karl Kumm, in the Geographical Journal of London.

fornia side, some 45 miles above Yuma. The narrow flood-plain on either side of the Colorado at this point is lower than the banks immediately paralleling the river itself. Ordinarily the river runs between its self-made dikes of silt; but in June, when the melting snows of the mountains at its source enormously swell its volume, it overflows its banks and inundates the low ground on either side. These lateral bottom lands are covered with a dense growth of willow, arrow-weed, etc., and it is in the original clearing of them that the farmer meets with his hardest task. For, once cleared and fenced against the cattle that range the river bottom, his procedure is simple in the extreme.

In the arable valleys the flood-waters cover the land little more than a month, being drained by natural systems of sloughs soon after the high water recedes. There is thus yearly left after the subsidence of the waters a new deposit of rich alluvial mud. In the fierce heat of the desert sun and with a relative atmospheric humidity of as low as five per cent, the rate of evaporation is extraordinary and the surface of the mud dries quickly. As it dries it cracks, marking the whole surface into large blocks of fairly rectangular form, the cracks between them being from one to five inches in width and about twice as deep (see pages 964, 965).

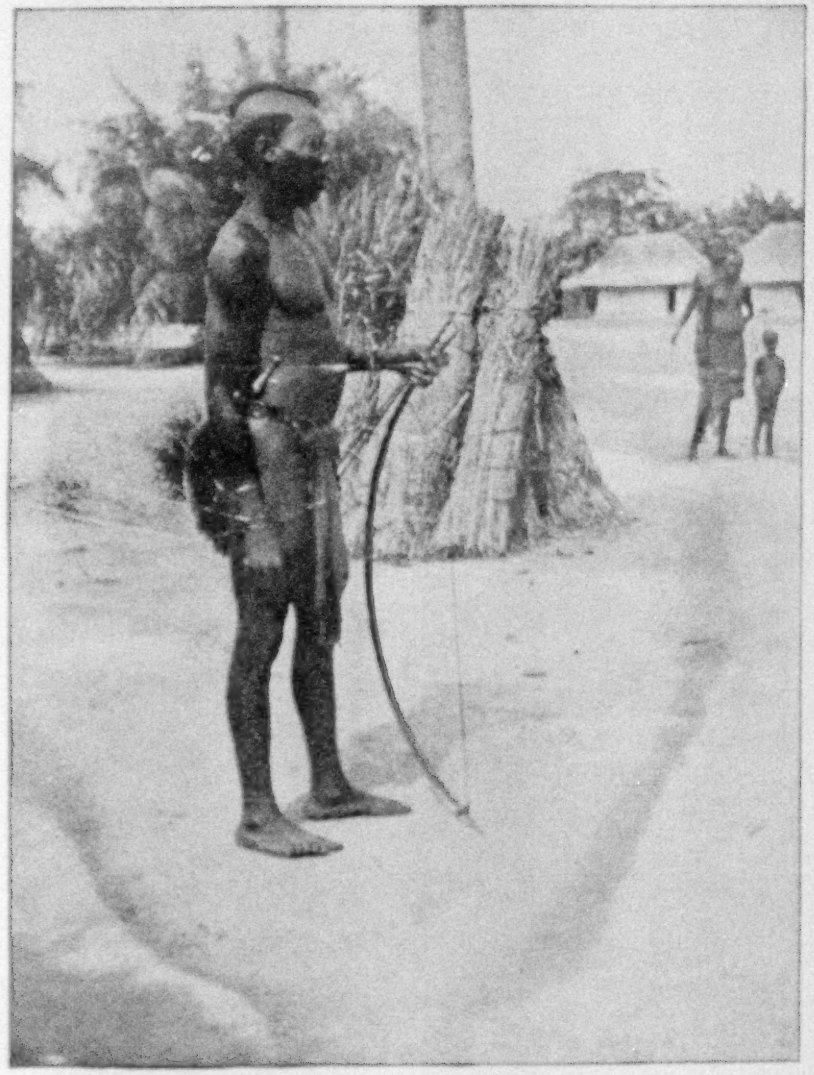
The ground thus prepares itself for the seeding, which takes place in late autumn. The farmer merely sows his seed broadcast over this surface, then brushes over it with rude brooms made of arrow-weed, so that all the seed finds lodgment in the open cracks. Abundant moisture remains beneath the sheltering cakes of dried mud, and grain and all sorts of vegetables thrive splendidly. No cultivation of any sort is given, and all that remains for the farmer to do is to harvest his crop, in April or May, before the next season's flood. Surely Nature is nowhere kinder to the farmer than here, where his fields are yearly irrigated, fertilized, and plowed for him by her forces.

## AMONG THE CANNIBALS OF BELGIAN KONGO

A RECENT number of the Geographical Journal of London contains an account by E. Torday of two years passed in the Kasai country of the Belgian Kongo. While the region explored is no larger than New York and Pennsylvania combined, it is so cut up by rivers and impenetrable forests that the tribes inhabiting the country vary greatly in their customs and language. Mr Torday found cannibals living undisturbed, and only a few miles distant geographically from these barbarous savages were endless plantations of millet and grain, tended by the most progressive negroes of Africa. The following notes are from his paper:

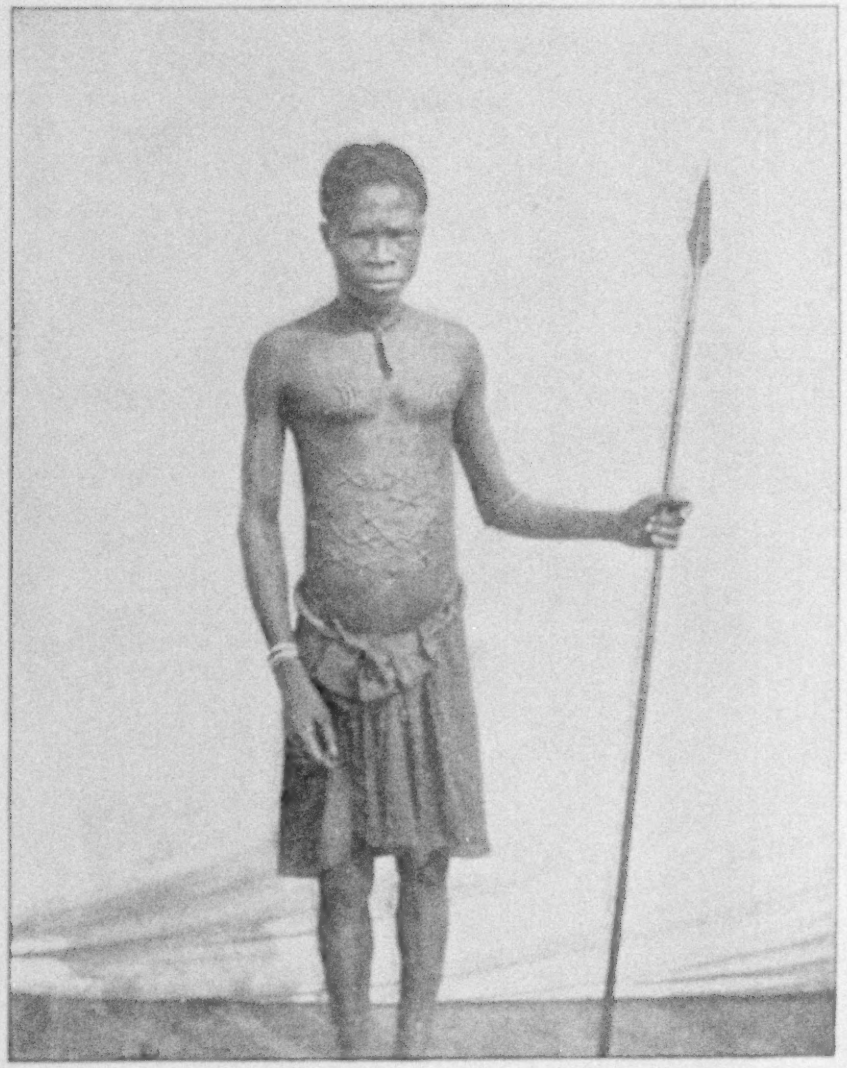
Each chief in the Bushongo country has a small group of pygmies under his suzerainty. These people hunt for him, and he provides them with vegetable food in exchange for their game. Now one group, abandoning the nomadic life, has established itself in a small village and has taken to agriculture. Only two generations have passed since they left the forest, and they have already lost their pygmy appearance. Though not as big as the Bushongo, they have attained a stature far superior to that of the average pygmy. As intermarriage between Bushongo and these "half ghosts" (which they are considered to be) is out of the question, it must be admitted that sunshine, air, and regular life have been the main factors in this change. The Bushongo, who believe that pygmies are semi-ghosts born from crevices of old trees, told us that these Batwa, since the time they adopted the normal life of human creatures, even reproduce like ordinary men, and showed us, as a great curiosity, some normally born young babies.

I cannot even make an attempt to give a description of the art of this people. Those who take interest in it will find in the British Museum many hundreds of objects collected by me, and will be obliged to admit that a really pure African art has been evolved by them—an art which must be ranked high, even



A BATETELA OF THE BELGIAN KONGO

Note the peculiar method of shaving the head. The members of this tribe were formerly cannibals, but have now become splendid agriculturalists and stock-breeders. They are very industrious and progressive. See page 971.



A BANKUTU CANNIBAL OF THE BELGIAN KONGO

The scars on the man's body show the tribe to which he belongs. These savages use poisoned arrows and spring guns. See page 971.

when judged by the standard of civilized peoples.

Cicatrization is practiced by all the tribes; in some by the men only, in others by the women only. The tribal mark of one tribe consists in a series of concentric circles on each temple. The incisor teeth are all filed to a point, and from this circumstance the Basongo Meno have received the tribal name which they now bear, meaning "People with filed teeth."

The cannibal Bankutus remove the upper incisors. Their dress consists of a pleated skirt, which does not quite meet on the right thigh; but the women in the south wear a hide girdle with a deep fringe of palm-fiber string. Among this tribe the slaves are compelled to wear a special dress, which is, in fact, the ordinary costume of the Akela, to which tribe most of them belong.

The Bankutu are great cannibals, as far as the male members of the tribe are concerned, and the victims are always slaves. In fact, all slaves are ultimately eaten, since it is believed that if a slave were buried his ghost would kill his master.

Their chief weapon is the bow, and poison is used on the arrows; shields are now obsolete. Property descends in the male line, but there are indications that at one time relationship was considered stronger on the female side. One of the most interesting points among this tribe is their use of a conventional throwing-knife as currency. The Basongo Meno also use this form of currency, obtaining it from the Bankutu, who are the manufacturers. The Bankutu are almost the only tribe of this region who have been successful up to the present in resisting the advance of the white man. This fact is due to their skill in forest warfare.

It is difficult to give a description of Bankutu warfare without falling into the style of the literature which so successfully educates the future Bill Sykes. It will suffice to say that the way leading to their village is defended by poisoned spikes hidden by leaves; that they use bows and arrows set like traps in the form of primitive spring guns, and are quite ready, if a white man is expected, to bait such traps with a live baby, being sure that the European will be unable to resist the temptation to pick up an apparently abandoned child. The poison they use is absolutely deadly. We were most inhospitably received by them, but no violence was attempted toward us, although we had no escort. When we reached Kole we were criticised for crossing such a country without an armed force. Our reason for taking this risk was that, had we had troops with us, we should have never seen the natives at all, and most likely should have been ambushed.

Only a few score miles from the cannibal country we found peace and security reigning everywhere. The endless plantations, clean villages, and well-kept houses made an impression of general prosperity. Of course, equal credit for this must be given to the character of the population; the Batetela is an excellent agriculturist and stock-breeder and very industrious. He is the least conservative of all negroes I know; any innovation will tempt him. Rice, Madagascar potatoes, and fruit trees imported by the white man are found in every village. We were received in all of these with the greatest hospitality, and in one village the chief presented us with 500 huge rations for our 50 carriers.

The people are scantily clothed, but this is, of course, of great advantage in their hunting expeditions. The havoc of sleeping sickness is greatly limited by the native custom of isolating cases of this disease in the forest. Several of the villages are assuming the proportions of towns. The native pattern of hut is discarded, and plaster-thatched houses, laid out in neat and regular streets, have taken their place. The neatness and cleanliness of these villages are most remarkable.

An interesting feature of Batetela psychology lies in the fact that suicide appears not to be uncommon and is regarded as an act of courage. Descent is reckoned in the male line, and children are considered as more closely akin to the father's family.

## NATIONAL GEOGRAPHIC SOCIETY

THE program of addresses before the National Geographic Society for 1910-1911 is as follows:

*November* 18.—"Wild Man and Wild Beast in Africa." By Colonel Theodore Roosevelt.

*November* 25.—"A Glimpse of Portugal." By Miss Laura Bell. Miss Bell was in Portugal for several months during the past summer, and has had an exceptional opportunity to understand the people and conditions of this picturesque country. Illustrated.

*December* 2.—"Four Journeys of a Naturalist in the Islands of the South Pacific." By Henry E. Crampton, Ph. D., of the American Museum of Natural History. Dr Crampton will tell of his travels in the Society, Cook, Tonga, Samoan and Hawaiian Islands, and in New Zealand. The natives, their every-day lives and ceremonies, the active volcanoes of Samoa and Hawaii, and the free life of the Pacific will be described. Illustrated.

*December* 9.—"My Friends, the Indians." By Mr Frederic Monsen. Illustrated with colorgraphs and motion pictures. Mr Monsen for years has been studying the Indians of Arizona and New Mexico, and his series of pictures of Indian life and manners are as beautiful as they are instructive.

*December* 16.—"The Glories, Sorrows, and Hopes of Ireland." By Mr Seumas MacManus, author of "A Lad of the O'Friel's," "Through the Turf Smoke," "Donegal Fairy Stories," "Ballads of a Country Boy," etc. Illustrated.

*December* 23.—Christmas recess.

*December* 30.—"From Babel to Esperanto—the Complication of Mother Tongues and the Simplicity of Esperanto." By Prof. A. Christen. Professor Christen is the leading authority on Esperanto. The growth of internationalism and the need of a world tongue lend interest to this topic. "Esperanto is spreading in almost every European nation, and is more easily learned and pronounced than any other foreign language. It is taught in all the higher military and naval schools of France, and at Lille has been taught in the public schools for the past three years."

*January* 6.—"Arab Life in Tunisia." By Frank Edward Johnson. Mr Johnson has probably seen more of the Barbary States than any other American. His lecture includes Tunis ("the White City"), the remains of Carthage and other buried Roman cities, Kairowan with its 85 mosques and 90 praying places, and descriptions of the Arabs in the oases and in the desert. Illustrated

*January* 13.—"The Methods, the Achievements, and the Character of the Japanese." By Mr George Kennan. Illustrated.

*January* 20.—"Making Pictures. The Wonderful Development of the Art of Photography and Its Value to Education and Commerce." By Hon. O. P. Austin, Chief of the United States Bureau of Statistics and Secretary of the National Geographic Society. Illustrated with motion pictures.

*January* 27.—"The Panama Canal." By Col. George W. Goethals, Chief Engineer Panama Canal. Illustrated.

*February* 3.—"Our Plant Immigrants." By Mr David Fairchild, in charge of Agricultural Explorations of the Department of Agriculture. The hunt for valuable new plants and fruits takes the agricultural explorers to many unknown corners of the world, and is a fascinating story of achievement. Illustrated.

*February* 10.—"The Balkan States." By Mr E. M. Newman. With motion pictures.

*February* 17.—"The Heart of Turkestan." By Mr William E. Curtis. Illustrated.

*February* 24.—"The Italy of Today." By Maj. Gen. A. W. Greely, U. S. Army. General Greely has just returned to the United States after spending a year in Italy, where he obtained much information as to the remarkable progress of modern Italy. Illustrated.

*March* 3.—"The Birds of Mexico." By Mr Frank M. Chapman, of the American Museum of Natural History. With motion pictures of roseate spoon-bills, man-o'-war birds, and white ibises.

*March* 10.—"From the Amazon to the Orinoco. The Five Guianas." By Mrs Harriet Chalmers Adams. With motion pictures.

*March* 17.—"Travels and Experiences in Mexico." By Mr John Birkinbine, President of the American Institute of Mining Engineers. Illustrated.

*March* 24.—"The Shrines of Greece: Olympia, Delphi, Eleusis, Athens, Mycenæ, Tiryns, Epidauros, and the Island of Crete." By Miss Marion Cock. Illustrated.

*March* 31.—"The Romance and Grandeur of Spain." By Dr Charles Upson Clark, of Yale University. Illustrated.

*April* 7.—It is hoped that former Vice-President Charles W. Fairbanks will be able to address the Society on this date on some subject connected with his recent journey around the world.

*April* 14.—"The Fiords and Fisheries of Norway." By Dr Hugh M. Smith, Deputy Commissioner of the Bureau of Fisheries. With motion pictures.

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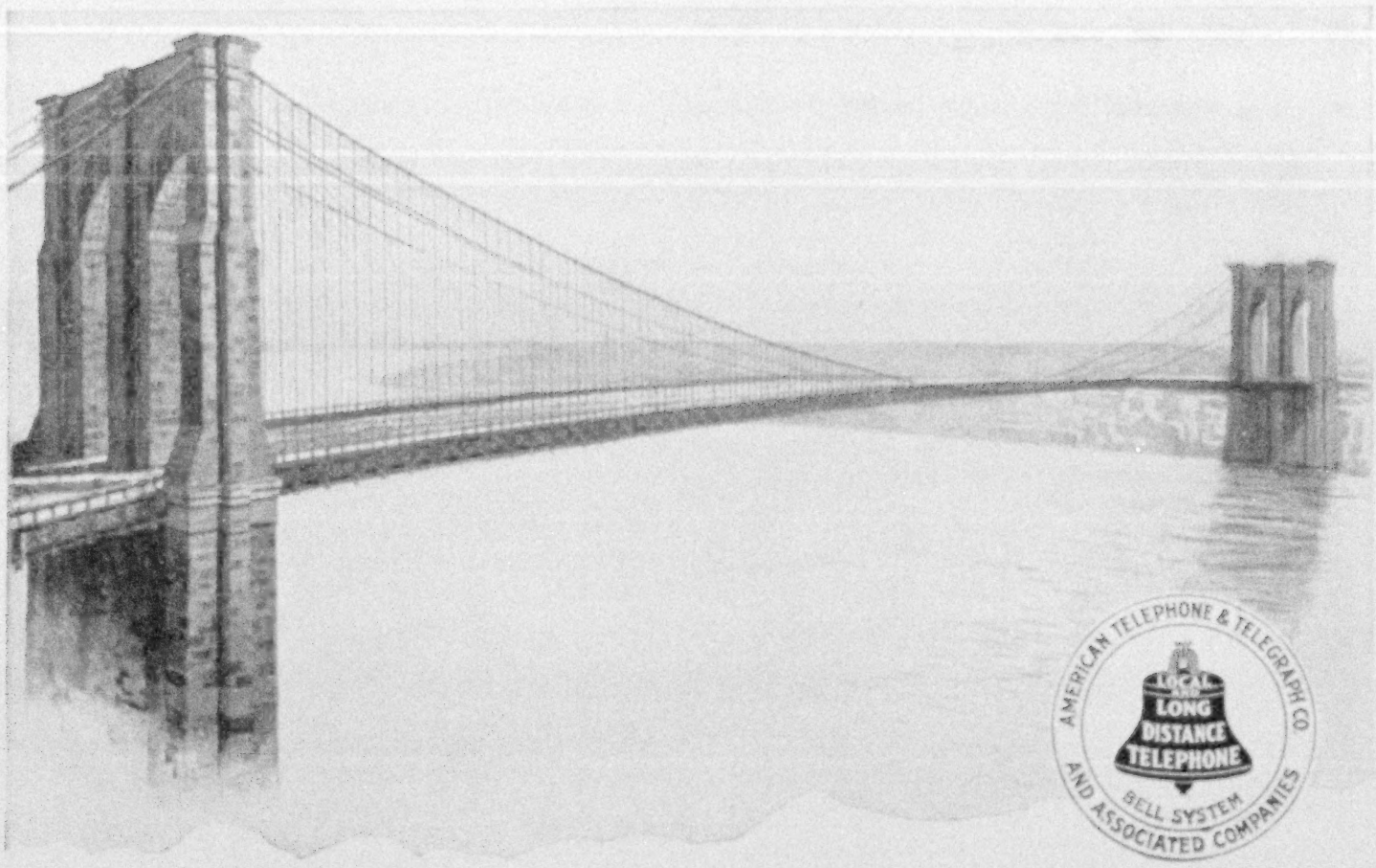


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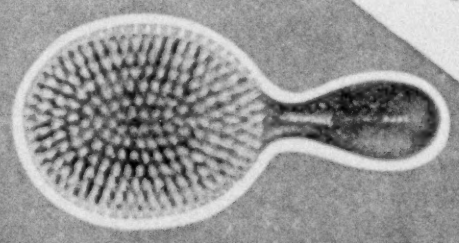

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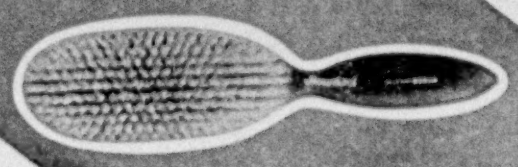

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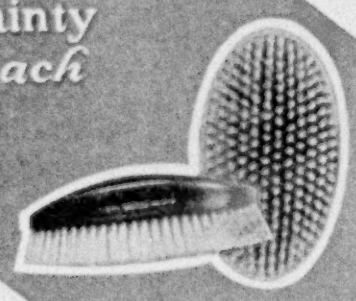

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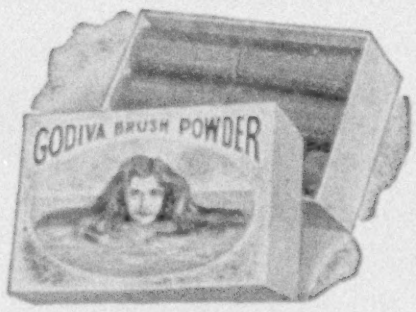


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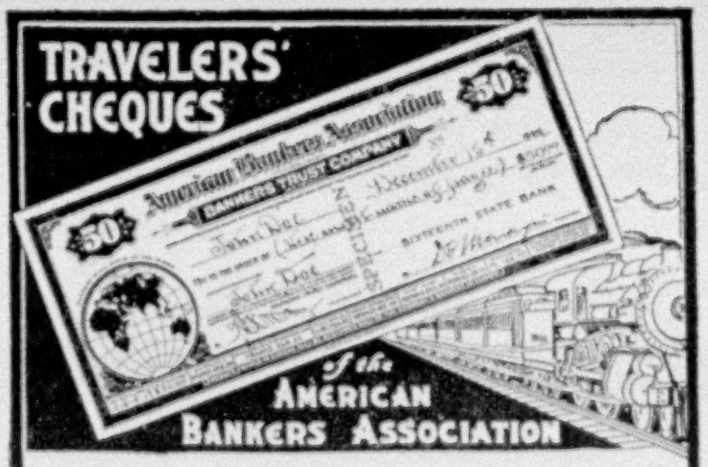


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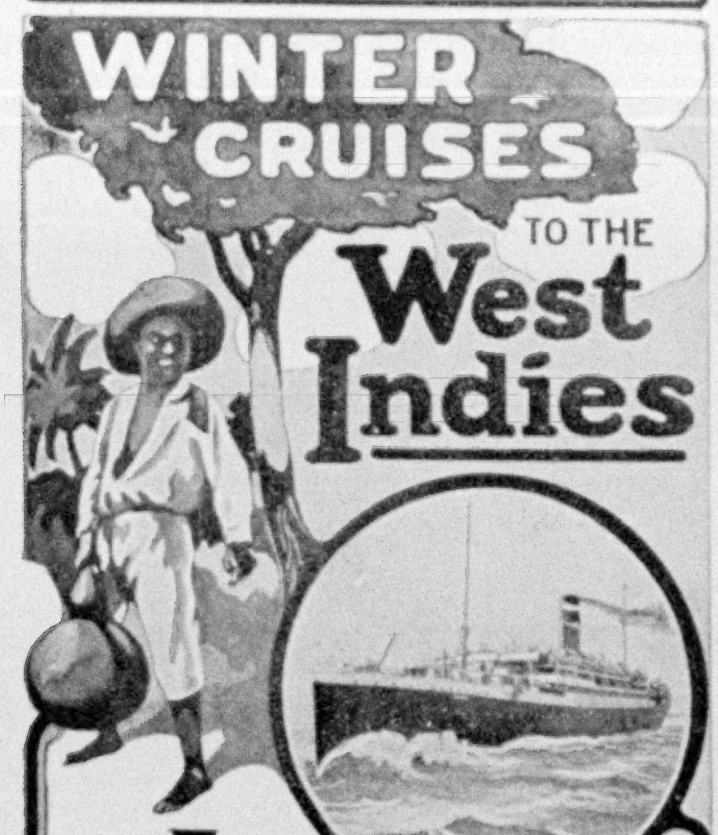

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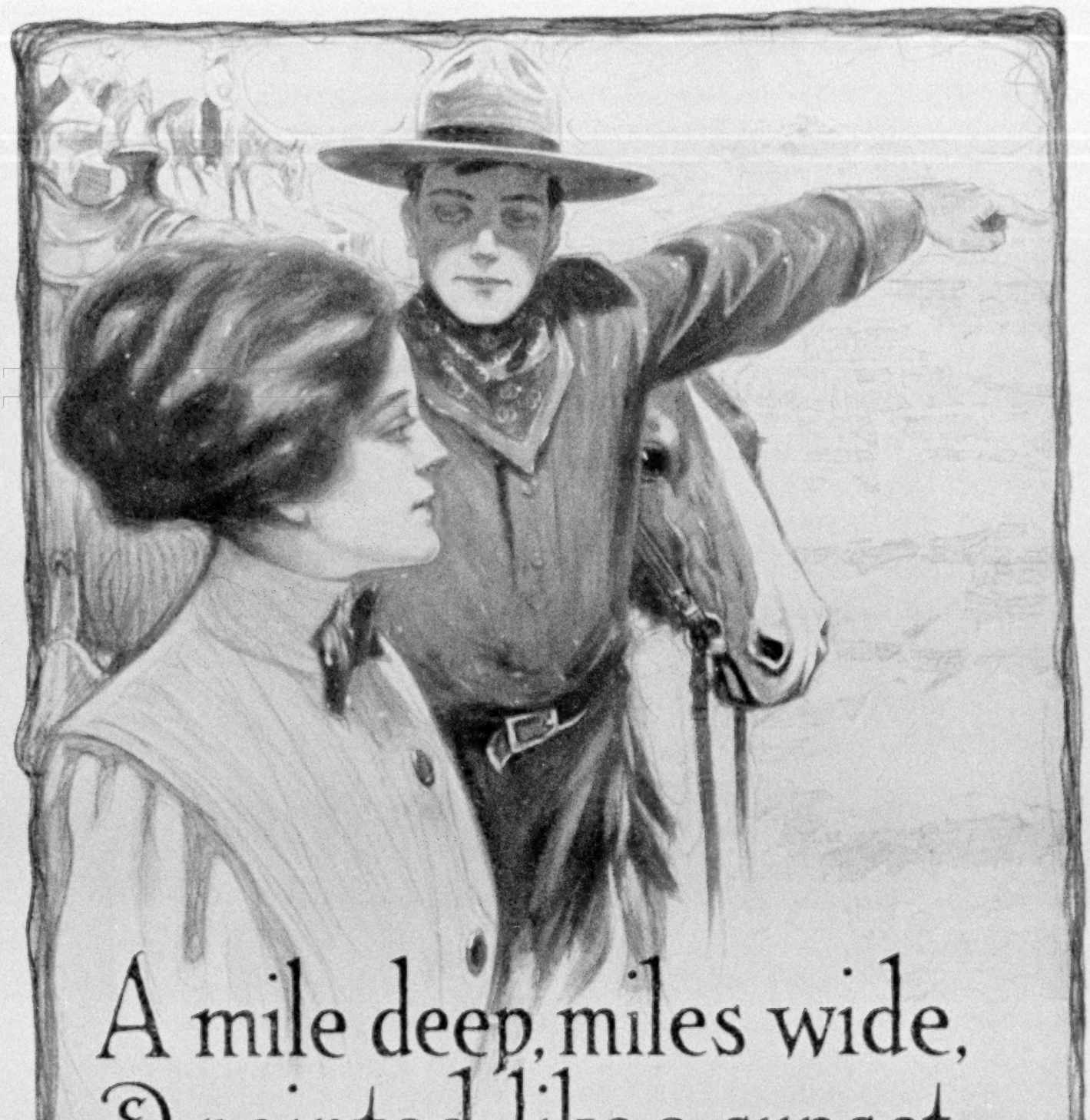

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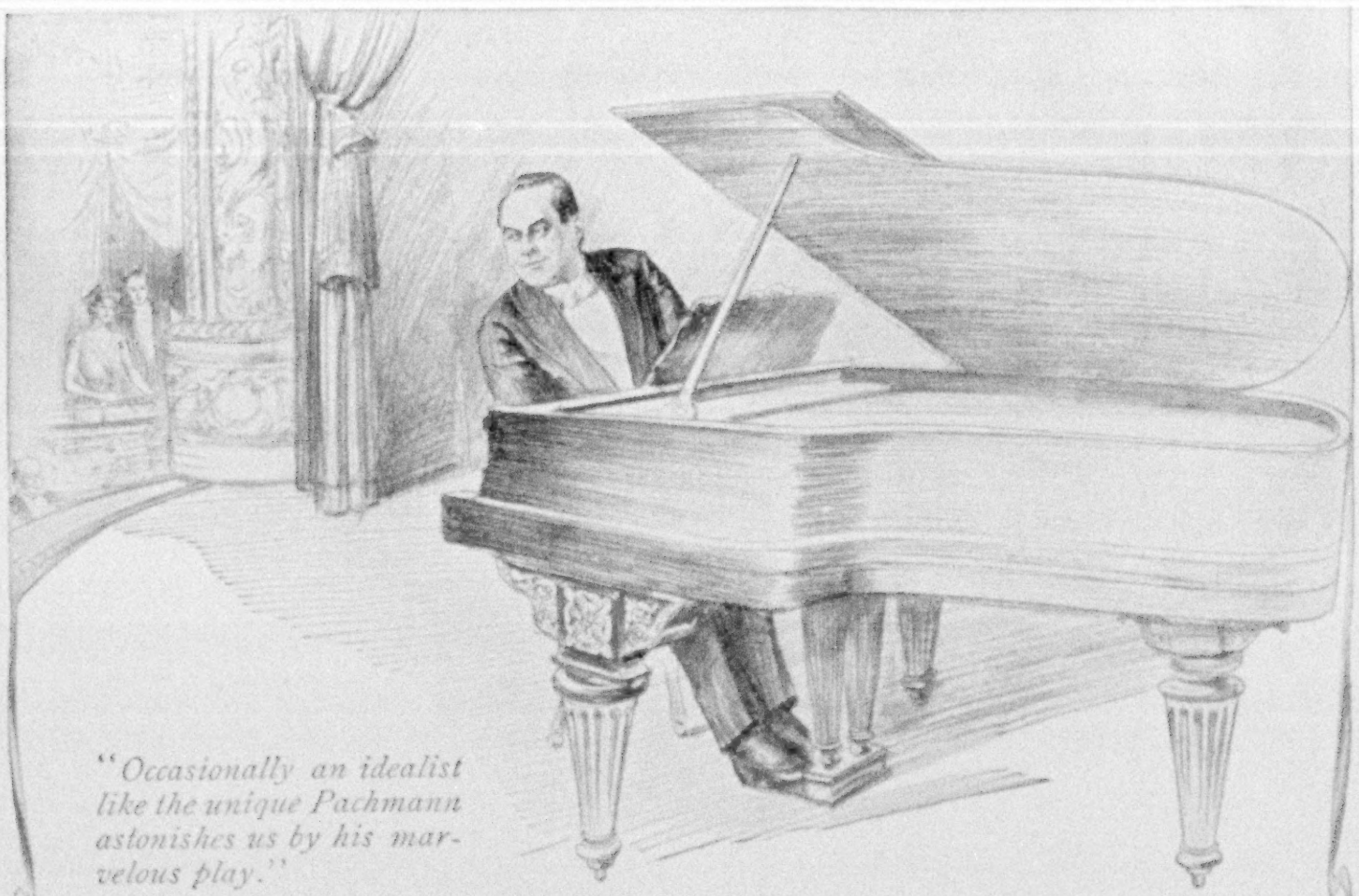

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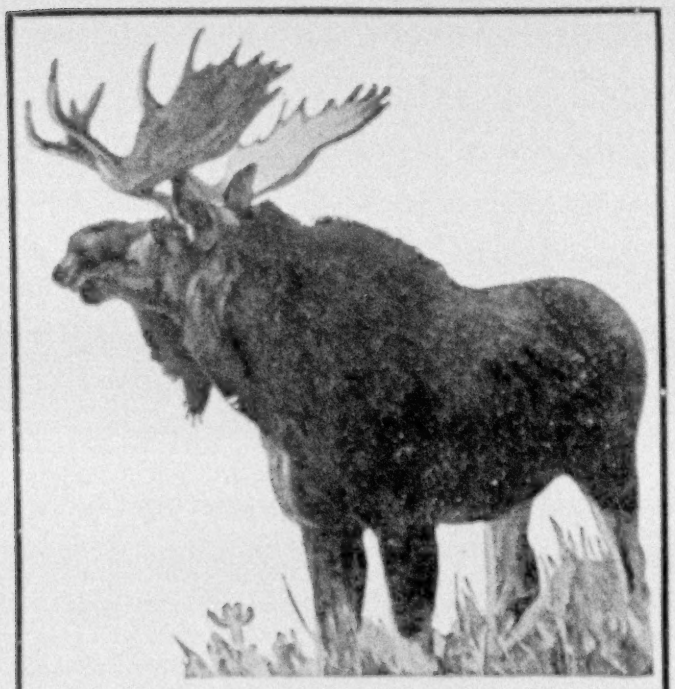

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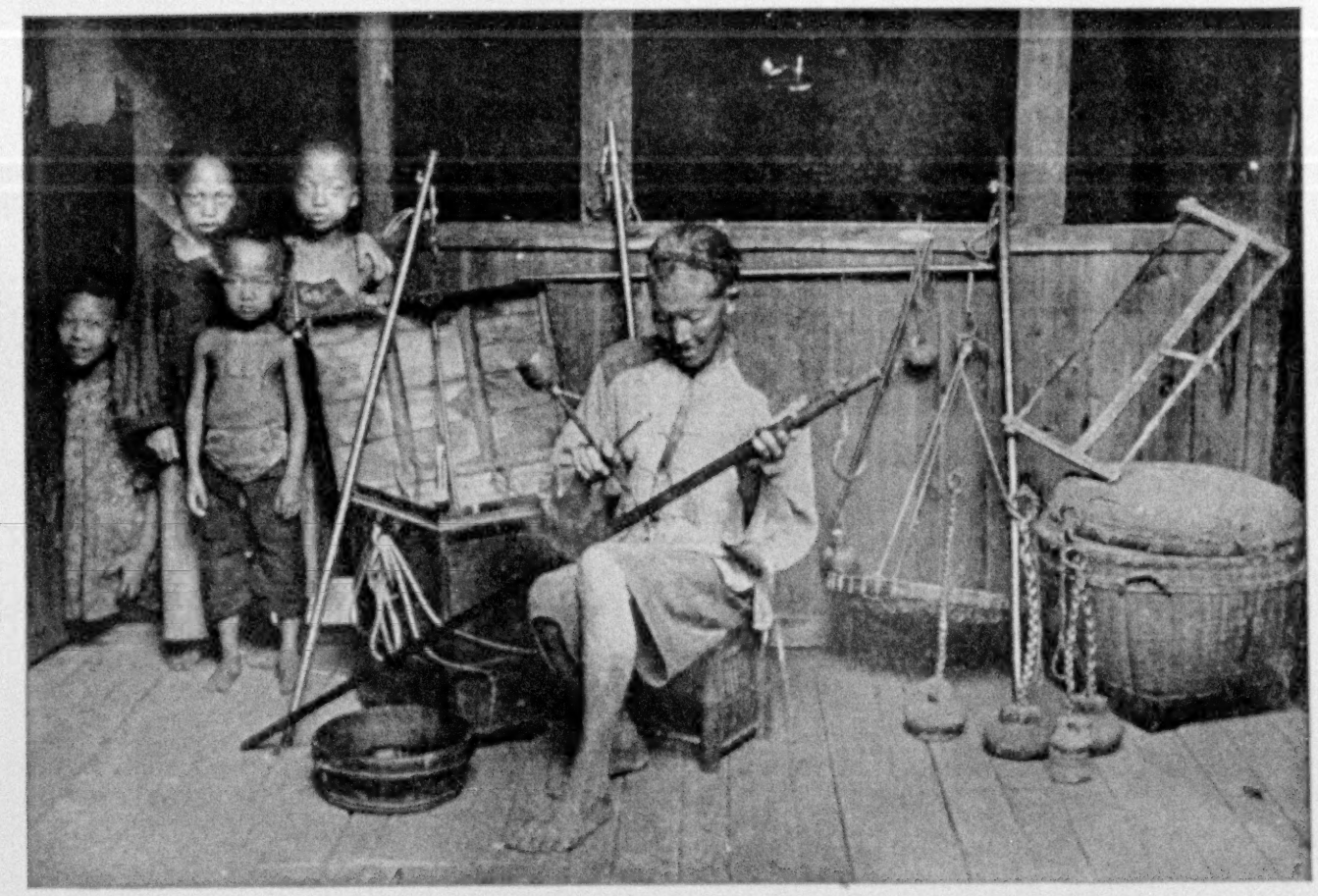

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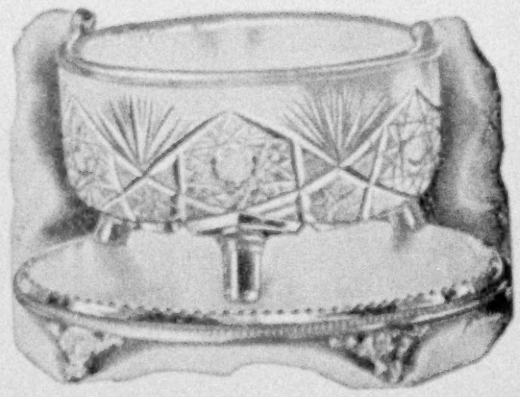

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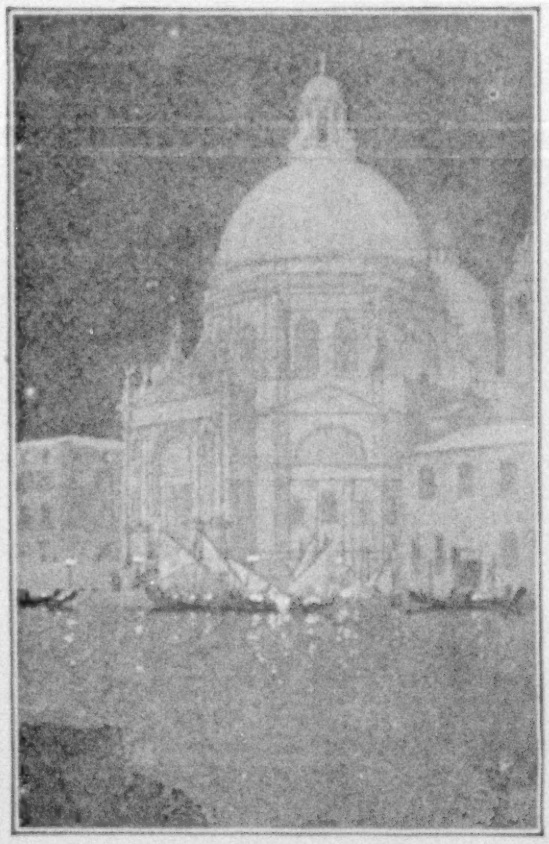

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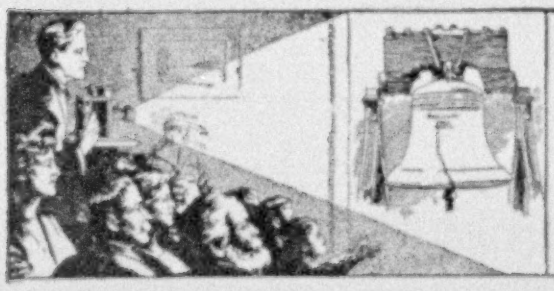

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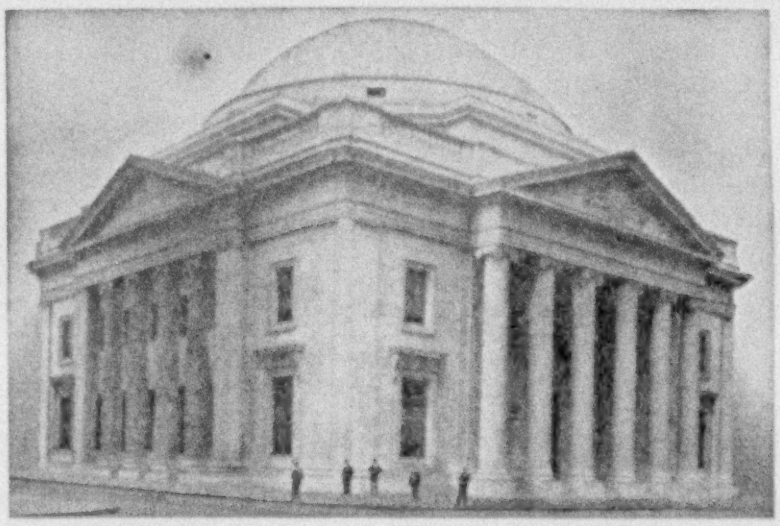

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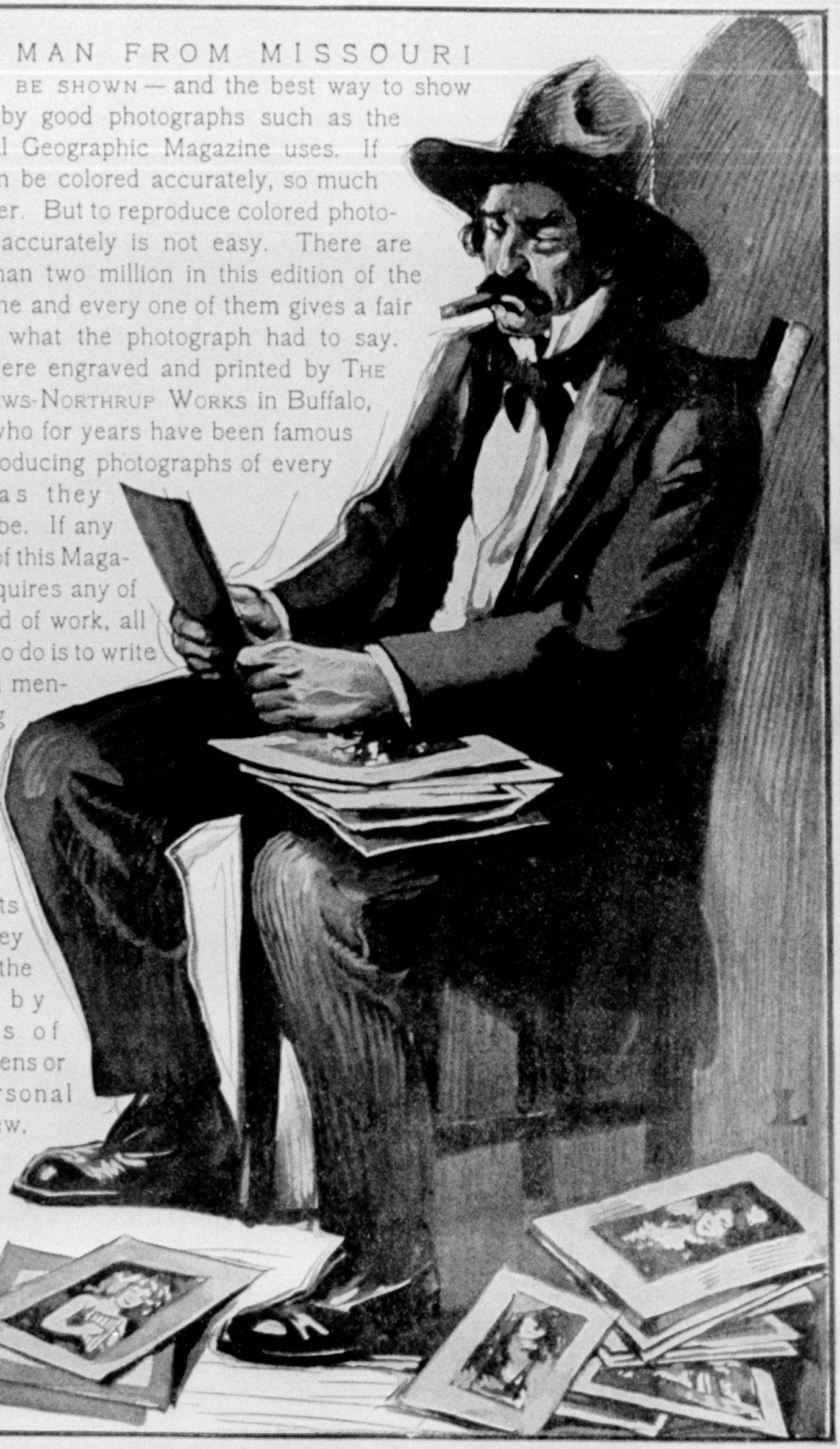
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